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ABSTRACT

These four 1988 issues of the journal of the Society for Accelerated Learning and Teaching (SALT) include the following articles: "Educating the Children of Changing Cultures"; "All Stars to Center Stage: Accelerative Learning in the School of Business"; "SALT in the First Grade Classroom"; "Unlearning Technologies: Coping with Anti-Suggestive Barriers in Industry Training"; "Suggestopedia: A Suggestive-Accelerative Teaching Technique in Teaching English as a Second Language to Adult Learners"; "Effects of Relaxation Training on Verbal Ability, Sequential Thinking and Spatial Ability"; "Effects of Music-Assisted Relaxation and Mental Rehearsal Training on Acquisition of Piano Performance Skills"; "Metaphoric Teaching: The Use of Metaphor in Teaching Science and Literature"; "Use of Suggestopedia with Limited English Speaking Hispanic Elementary Students"; "Relaxation and Educational Outcomes: A Meta-Analysis"; "A Meta-Analysis of the Effects of Suggestopedia, Suggestology, Suggestive-Accelerative Learning and Teaching, and Super-Learning on Cognitive and Affective Outcomes"; "Alpha Brain Wave Formation by Sine Wave Stereo Sounds"; "Implementing Whole-Brain Methods for Reading Instruction"; "A Suggestopedia Program in Japan"; "Suggestopedia in Terms of the Second Language Acquisition/Learning Theory of Stephen Krashen"; "Effects of Guided Imagery on Basal Metabolic Rate"; "Imagery's Physiological Base: The Limbic System"; and "Learning Research Combining Cognitive Processing and Suggestopedic Variables." (MSE)

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THE JOURNAL OF THE SOCIETY FOR ACCELERATIVE LEARNING AND TEACHING

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The Editor welcomes submission of manuscripts on an interdisciplinary nature relevant to all aspects of suggestive learning-teaching-therapy counseling within the theoretical and procedural confines of Suggestology and/or Suggestopedia. The JOURNAL FOR THE SOCIETY OF ACCELERATIVE LEARNING AND TEACHING will publish a wide variety of articles - including critical reviews, theoretical analyses, speculative papers, case studies, quasi-experimental studies, as well as reports of empirical research (basic or applied) of major significance. The basic focus is Suggestopedia theory, research and application.

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Educating the Children of Changing Cultures

Donald H. Schuster
Iowa State University
and
Margaret L. Schuster

Abstract. This is a study of how changing motivational drives influence learning and education. As a culture matures the people are motivated sequentially by the dominate aspect of themselves, body (physical), mind, or spirit (creative, intuitive). This changing motivational drive affects learning and teaching methods for the new age, the aborigines and tribal people alike.

Through historical analysis of educational practices over 2 millennia, we cataloged classroom techniques that characterize and work best in each phase of maturation. Not only are current U.S. classroom practices inefficient and outmoded, but practical methods to improve educating our young people are discussed. SALT is part of the answer.

* * * * *

Introduction.

The purpose of this paper is to give an overview of educating the child in a changing culture, a stratified society, as well as in different parts of the world.

You enter the laboratory and find on the table three samples of H_2O ; one is a block of ice, one a vat of water and one a flask of steam, the three states of

matter. You are told to change each of these samples in the same direction by a similar process. You think to yourself, "I can pour the water into a different shaped container, but I cannot pour the ice, and only with difficulty the steam. I could condense the steam by cooling, but cooling would not condense either of the other two. You come to the conclusion, I need different methods to influence each sample."



This illustrates a problem we have with teaching. People are not all alike. Socrates, Quintilian--in fact almost every great teacher has emphasized the importance of recognizing individual differences and yet the problem remains. (Cole, 1966).

Recently we developed a model of cultural change (Schuster and Schuster, 1987), that sheds light on cultural differences. Our research indicates there are three major internal motivational drives, each causing people to receive and process information differently. These three different types of students are often in your classroom, but are not readily recognizable.



Basic Concepts of the Maturation Motivation Theory of Cultural Change

We found that cultures like individuals mature through three phases of growth (see Fig. 1). These three phases correspond to three aspects of the individual, body, mind and spirit. One of the three aspects tends to dominate the individual or the culture during any particular growth phase. For example a child is dominated by his or her physical aspect--eating, sleeping, growing, identifying with people or animals. Similarly a young culture dominated by its physical aspect is occupied with producing and feeding large families. Over 90% of the people will be working the land, using their muscles and emotions to resolve their problems.

Then a change occurs. The child becomes interested in using its mind. Why? How? When? are the questions. A culture also changes after many generations of being in the body state. The people begin fighting for a different religion, a different government; in fact all aspects of the people's lives change as their minds begin to dominate their way of life.

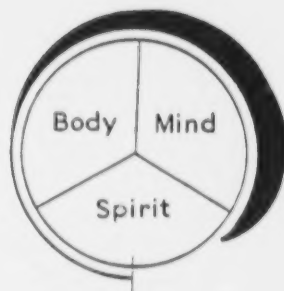
Similar to the H_2O that changes with added energy from ice to water to a gaseous state, or the maturation of the egg into a worm that emerges into a butterfly, there is a third change. Our senior citizens with their wisdom and philosophies (spirit state) no longer have the same interest and abilities they had as producing young adults. A culture also changes and matures into the phase dominated by the spirit aspect of its population.

The spirit phase is the phase the Caucasian race is slowly moving into according to our findings. The

Fig. 1. Population distribution of a culture maturing into a stratified society.



Body State



Mind State



A Culture Begins,



Early Spirit
State

United States and Europe have been the leading nations, the nations with the power, the knowledge and high standard of living. But now we find our intuitive, creative, and loving aspects are replacing some of the more logical, reasoning ways to explore life. The arts are changing; flying, floating, spatial feelings are becoming dominate. We hear the words--visualization, imagery, meditation. The people are turning within themselves to find answers.

The two to three thousand year cycle of nations of people maturing through the three phases--first being dominated by their body (physical) aspect, then the aspect of the mind followed by the spirit aspect--gives us a stratified society (see Fig. 1) and a globe of cultures in different phases of maturation.

The people of any one maturation phase have totally different realities than people of any other phase. Sorokin (1951) a prominent sociologist said, "As a culture changes from one phase to another, the change involves simultaneously almost the whole society --art, science, philosophy, religion, law, morals, manners--almost the whole of life, thought and conduct."

We observe these difference in our own political theater. One leader says, "Let's sit down and think through our differences and problems." (mind state) The leader of the other culture replies, "No, I want to fight." (body state) We discover these same differences in our educational system.

Review of the Literature

The concept of changing phases of internal motivational drives with the maturation of a culture seems to be a new concept in education. Although we were able to

find references to these changing phases in history (Schuster and Schuster, 1987) we were unable to find any mention of their being consciously used in education.

We therefore searched the literature for the evidence (1) of change from one internal motivational drive to another on the part of the people, and (2) the methodology the great teachers used to adapt to these changes. In summary, we can recognize the three phases of maturation that developed during the Middle Ages similar to those present in the study of Greece and Rome: (1) memory and imitation--Body state, (2) logic, reasoning and systematic organization--Mind state, and (3) humanistic qualities, the joy of learning, creativity and of course the full blooming of all the arts--Spirit state.

North America

By the 17th century the colonists had endured many stresses and strains. Large numbers returned to the old country until the new became more civilized. The work of civilizing America was primarily physical in nature. The first census, 1790 indicated over 90% of the people were farmers.

For this early Body state period Butts (1961) described the education in the United States as mostly memorizing and whipping as the main method of teaching. Most children who attended school went for only two or three years. About 90% attended no school at all.

Beginning in the 1830s the people organized state systems of public schools that would be open equally and freely to all. Democracy, a Mind state philosophy was beginning to shape the education system. Physical

punishment gave way to discipline, training the mind to be in control. "Do as you are told."

The Mind state period, roughly the 1800s and 1900s, highly structured the educational system. Normal schools appeared to train the teachers. School administration was studied. Many new subjects were added to the curriculum. Bookkeeping, geography, history, languages and the new sciences were the first to be added to the usual reading, writing and arithmetic. Currently there are more than 2000 courses offered in the Harvard catalogue.

Education is a Mind state product. Its growth accelerated quickly, reaching a peak just before the Spirit state characteristics became visible. About 70% of all college buildings in the US were erected after 1950, more than one-third of them in an eight-year spurt following 1966. (Time, 1980)

Measuring, testing, organizing, grading--the structuring of every phase of learning and teaching dominated this period.

Mann, Horace (1796-1859), the father of education in the United States played a leading part in establishing the elementary school system. He founded the first normal (teachers) school in 1839 at Lexington, Massachusetts.

Cubberley, Ellwood Patterson (1868-1941) helped develop the profession of school administration, organizing the operations of the schools.

Judd, Charles Hubbard (1873-1946) a researcher in psychology, contributed to the measurements of achievement in school subjects.

Thorndike, Edward Lee (1874-1949) made many contributions to the study of learning, teaching and mental testing. His books include *Mental and Social Measurements* (1904); *The Measurement of Intelligence* (1926); *Fundamentals of Learning* (1932).

Guilford, J. P. (1897-1987) had a special interest in measuring the intellect and creativity. Two of his outstanding books are: *Fundamental Statistics in Psychology and Education* (1965); *Way Beyond IQ* (1977). Guilford's study of creativity lead us right into the Spirit state.

The Space program, the Computer age, the great advancements in medicine all attest to the use of logic and reasoning, and a systematic organization of new material as a method of learning. The motivation was largely built around competition, the strong Mind state ego. Grades, honors, conferred degrees, scholarships, earning potentials seemed to be stimuli enough to keep a student studying for a third of his or her life.

The stress of World War II pushed the generation of the 60's into the Spirit state. Conscientious objectors refused to fight, women were entering the work field in increasing numbers, the younger students were losing interest in school, the structured family unit was breaking down, corruption was being exposed in the higher government offices, the mind state values were changing.

The change was noticed in the educational system. The SAT (Scholastic Achievement Test) scores started to drop. Illiteracy was on the increase. The young people were looking for a different way of life.

The New Age teachers are exploring the intuitive, right half of the brain, imagination, fantasy, expectancy, group learning, suggestion, consciousnesses, creativity, unconscious reserves, and the arts. The early creative teachers for the new Spirit state were: A. H. Maslow, C. Rogers, F. Perls, G. K. Lozanov (Bulgaria), A. Caycedo (Columbia, S. A.), M. H. Erickson.

The highly structured, ego-dominated Mind state phase produced many children with mental aberrations. The sensitive mind, was pressured, molded until in many instances inhibited, in its ability to learn. The leaders in education became concerned and applied their efforts to developing therapeutic techniques.

Perls, Fritz (1893-1970) worked with the transition from the orthodox psychoanalysis to the Gestalt approach. He examined various psychological and psychopathological reactions of the human organism within its environment.

Erickson, M. H. (1901-1980) one of the most creative, perceptive and ingenious psychotherapeutic Masters of all times. "Each person is a unique individual." Hence psychotherapy should be formulated to meet the individual needs.

Maslow, Abraham H. (1908-1972) began a humanistic movement and a study of higher levels of consciousness. He felt education should be a free and creative development of one's distinctively human powers, including one's aesthetic pleasures and self-actualization. His books include: *Motivation and Personality* (1954); *New Knowledge in Human Values* (1959); *Toward a Psychology of Being* (1962); co-founded the *Journal of Humanistic Psychology* (1958).

Rogers, Carl R. (1902-1986) felt the need for new models of science more appropriate to human beings. It should include the strivings, emotional feeling, and ideas that the individual recognizes, interprets and values as his very own. His books: *A Way of Being* (1980); *On Becoming a Person* (1961). Rogers felt the approach to self-equalization should be from within the individual.

Lozanov, Georgi K. (1926-) Bulgaria, founded a teaching system called Suggestopedia. Paramount to learning the student must have a positive attitude toward the subject matter and toward himself as the learner. The Suggestopedic method requires that learning be enjoyable and easy, which in turn makes remembering spontaneous. Lozanov also makes use of the paraconscious, the imperceptible subsensorial, subliminal level of perception which he calls the "reserves of the mind."

Caycedo, Alfonso (1932-) Colombia, S.A. created independently a philosophy similar to Suggestopedia. Medical Sofrology emerged as a study of human consciousness; a method of training human personality. Among his books, is *La India de los Yoguiis* (1966).

With the coming of the New Age there has been a barrage of books, articles, journals each presenting newly found information on educating the New Age student. To mention only a few: *Cooperative Learning*, by Slavin; *Learning Together*, by Johnson and Johnson; *Mind Sight*, by Galyean; *Suggestive Accelerative Learning Techniques*, by Schuster and Gritton; *Drawing on the Right Side of the Brain*, by Edwards; *The Total Physical Response Approach to Second Language Learning*, by Asher; *Improved Instruction*, by Hunter; *The Journal of Humanistic Psychology*.

A review of the development of the educational system for Greece, Rome, Middle Ages of Europe and North America indicates that each culture matured through three distinct phases. The physical phase taught physical activities, the motivation was physical, mostly "whippings". Learning was by memory. The Mind phase was involved with the activities of the student's mind. Emphasis was given to logic, reasoning, organization of new material and structuring the educational program.

The intuitive, creative phase (Spirit) involved a study of the individual student, his or her perception, motivation and ability to relate to the environment and fellow students creatively and intuitively.

We feel the consistent ordering of the three phases in each of the four examples cited and the philosophy of the great teachers and their chronological place in the history of their culture lend indirect support to our model of the Maturational, Motivational Model of Culture Change as applied to education.

Change with Maturation

Among our family of nations spread around the globe we perceive each member as occupying a slightly different position on the maturation scale. Refer to Table 1 for an approximate order of development based on the number of live births per 1000 population. (Data from Morgan, 1984). In our earlier research (Schuster and Schuster, 1987) we found fertility surprisingly to have the highest factor loading (0.95) on the cultural maturation-motivation factor. The reproductive ability (live births per 1000 population) could be used to estimate the comparative maturation of a culture. This same observation can be made with people: the age a person can reproduce itself is an accurate indicator of his or her maturity.

Table 1: Demographic Indicators

Country	Births / 1000 Population	Females in Higher Education	Males in School Age 12-17	Female Literacy	Male Literacy	Female Infant Mortality	Male Infant Mortality	Female Life Expectancy	Male Life Expectancy	Females in Work Force	Year of Women's Suffrage	Rate of Natural Increase		
		%	%	%	%	%	%	per 1000	per 1000	yr.	yr.	%	year	%
Kenya	53	22	40	58	10	30	76	90	58	54	33	1963	39	
Nigeria	50		14	24	6	25	144	170	49	46	40	1977	32	
Saudi Arabia	49	27	20	32	19	48	142	158	49	47	5		31	
Zimbabwe	49	3	19	30	31	48	124	134	55	52	29	1979	34	
Afghanistan	48		4	23	4	19	208	244	43	42	19	1965	27	
Sudan	48	20	12	25	4	25	133	148	48	46	11	1964	30	
Libya	47	17	22	64	4	38	123	137	57	54	6	1963	34	
Nicaragua	47		48	47	57	58	115	128	57	54	22	1955	35	
Ghana	48		38	56	18	43	105	124	50	47	42	1950	31	
Algeria	46		35	64	14	42	134	150	57	55	7	1962	33	
Nepal	45	21	4	17	5	33	138	128	41	43	39	1951	25	
Pakistan	44	21	6	18	6	24	139	145	52	52	11	1956	28	
Iran	44	33	40	67	26	69	103	123	54	53	14	1963	30	
Morocco	43	26	20	36	10	34	126	140	57	54	16	1959	29	
Guatemala	43		24	32	38	54	71	81	59	57	14	1965	31	
Ecuador	42	34	52	56	70	78	66	74	62	58	27	1929	32	
Vietnam	41	33	45	45	78	78	103	127	49	46	45	1945	23	

Peru	40	30	67	80	62	83	87	97	58	55	29	1933	28
El Salvador	40	50*	49	56	33	67	45	56	64	60	33	1946	33
Egypt	38	47	27	49	29	57	85	95	56	54	8	1956	28
Brazil	36		52	54	63	69	103	115	67	61	28	1932	23
Venezuela	36	50	58	53	73	80	40	50	68	65	30	1946	30
Lebanon	34		55	70	58	78	61	68	67	63	25	1952	24
Indonesia	33	36	32	42	49	71	129	152	52	50	34	1941	20
Thailand	32	53*	29	39	70	87	61	75	63	58	47	1932	23
Sri Lanka	28	38	54	54	68	86	36	47	65	62	25	1931	21
Argentina	26		66	61	92	94	42	48	73	66	26	1947	17
Korea	23	30	56	70	81	94	34	42	65	60	38	1948	16
Ireland	22	43	85	81	98	98	15	21	75	70	28	1918	12
China	21	24	18	18	67	86	49	53	70	66	38	1921	15
Chile	21	39	85	85	87	89	38	42	69	62	36	1949	14
Poland	20	56*	78	73	97	99	20	27	75	67	46	1919	11
Rumania	18	42	95	99	84	94	27	47	73	68	45	1946	8
Cuba	18	42	63	67	80	76	22	21	74	70	31	1934	12
Soviet Union	18	52	95	95	100	100	17	18	74	63	51	1917	8
Portugal	17	44	54	57	65	78	35	43	72	66	41	1976	7
Yugoslavia	17	45	79	90	76	92	35	43	78	65	36	1945	8
Spain	17	52	61	67	86	94	12	23	76	70	29	1931	9
Hungary	16	50	71	77	98	98	26	33	73	67	45	1945	3
New Zealand	16	44	83	84	99	99	10	13	75	68	24	1893	8
Canada	15	46	90	89	98	98	13	16	77	70	41	1918	8
East Germany	14	53	84	84	99	99	14	18	75	69	50	1919	0
France	14	42	85	79	97	97	10	14	77	69	44	1945	4
Norway	13	50	89	88	99	99	10	11	78	72	42	1913	3
Italy	12	41	70	77	93	95	20	25	76	70	29	1945	3
Netherlands	12	33	88	90	100	100	10	12	78	72	30	1919	4
Britain	12	37	85	85	99	99	12	16	75	69	42	1918	0
Denmark	12	48	76	87	99	99	7	10	77	71	38	1915	2
Austria	11	39	72	70	99	99	16	20	75	68	39	1919	-1
West Germany	9	36	93	90	99	99	17	22	75	69	38	1919	-3

*: median of source values. *: computed from source data.

We included the table as a visual aid so the reader may see the gradual change of characteristics from the younger to the older cultures. But reproduction is also influenced by wars, famine, epidemics, birth control programs and legalized abortions. The ordering of nations this way is only approximate.

The people of each nation are working and developing with the usual number of growing pains. Some of the younger cultures look at the wealth and education of the older nations, and feel if they could achieve this position quickly they would be happy forever after, not realizing that growth and maturation is a never-ending process.

that first matured into the Mind state, and now it is the sons of the elite who are first maturing into the Spirit state. As the leaders of 6th century China worried, "It is the scholar-gentry, the class that traditionally provides leadership and guidance for the entire nation that was turning to the arts and nudity". (Creel, 1937).

Over the last 3000 years different nations and different races of people have matured into being the leader of the world for a short time period: Egypt-14th century B.C., Greece-5th century B.C., Rome-2nd century B.C., India-6th century A.D., China-7th century A.D.

In Europe during the 15-18th centuries several civilizations in turn were the cultural center of the world at that time. People came from all around to seek knowledge at its learning centers, to learn the new thought in religion, and to trade at its centers of commerce.

Currently the Asian countries are maturing into the Mind state, with Japan in the lead. Japan is now rated

the highest nation in technology and their college-bound have the highest scores on the SAT tests. Our research suggests that maturation is a constant process from phase to phase, from one cycle to another cycle.

As a teacher who lectures abroad or who periodically receives in your classroom children from other cultures, you will find comfort for you and your students, if you are aware of a "readiness" for different types of education.

Northern Drift

Maturation moves across a country in a pattern. Remote and poorer agricultural areas develop slowly. As people mature into the Mind state they seem to become energized and choose to move to cooler climates, North or higher altitudes, and away from the masses, leaving the people in the South to enjoy a slower rate of development. Note that this would reverse itself in the southern hemisphere.

To test the observation of energized peoples moving to cooler climates, we made a correlational study of university students' body temperature, grade point and their answer to this question: "If you had to move from your present location would you choose to move to a warmer or cooler climate?" Students with a higher body temperature (and also a higher grade point) chose to move to a cooler climate. ($N=78$, $p<.01$).

A study of a large nation shows two patterns of development. One is the slow maturation of the people as they radiate out from the areas of early settlement; the other is the northern drift.

The 1984 SAT (Scholastic Aptitude Test) scores show both patterns (See Table 2 and Fig. 2. The oldest

states, the original 13 had the lowest SAT scores (ave. = 873) suggesting through maturation the students are no longer motivated in a Mind state educational system. The next area settled was over to the Mississippi river. The SAT scores for this group of states ranked above the first 13 (ave. = 953). We find the top ranking group of 9 states on the front edge of change in the Northern section of the Midwest (ave. = 1047). See Table 2. The states on further West and South have lower SAT scores (ave. = 949) in a nonlinear pattern. Our research leads us to believe it is only a matter of time before maturation motivates these western and southern students to be the top in the nation in a Mind state system.

We correlated the historical, geographical coding (1 to 4) as an index of maturation-motivation with SAT scores per state. The resulting r is 0.467 ($p < .01$). The non-linear correlation of 0.807 is significantly higher ($p < .01$). This relationship is plotted in the top part of Fig. 3 and shows a definite hook. This hook in our interpretation reflects a not-yet-peaked motivation for school learning for students in the southern and western states (group 4) vs. the currently peaked school motivation of students in the top group of states.

We also correlated births per 1000 data (1980 census) with the 50 states' SAT scores, with the resulting r of 0.415 ($p < .01$) and plotted this in the bottom part of Fig. 3 vs. our historical-geographical grouping (1 to 4). This bottom curve is quite similar to the SAT score curve in the top part of Fig. 3.

We want to remind the reader as usual that correlation here does not imply causation. The issue of maturation--motivations causing such changes as we see here was addressed in an earlier paper (Schuster et al., 1987). The most we can say here is that the

Fig. 2 Historical Development Regions and SAT Score Rankings

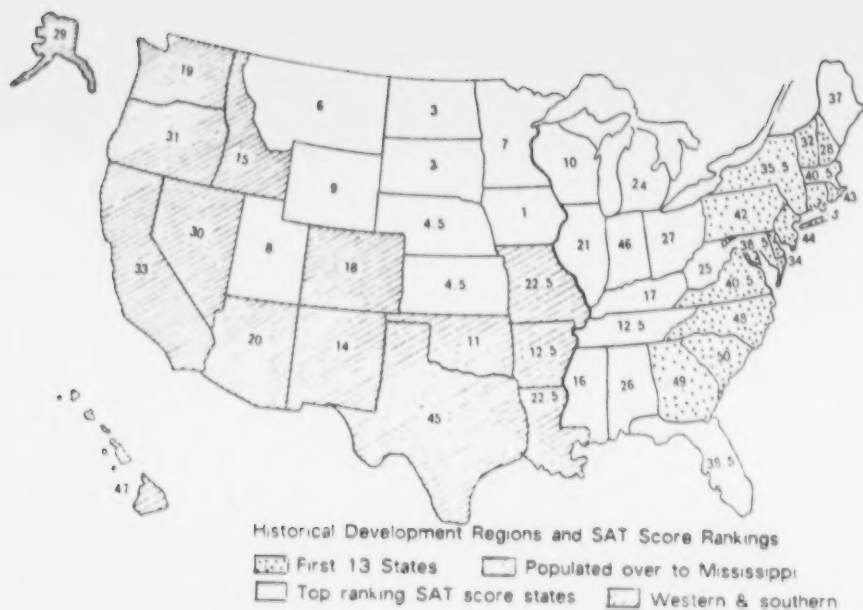


Table 2. Average SAT scores and ranks of the 50 U.S. states grouped by historical development.

<i>First Thirteen States</i>	<i>SAT Scores</i>	<i>Rankings</i>
Connecticut	896	35.5
Delaware	897	34
Georgia	823	49
Maryland	889	38.5
Massachusetts	888	40.5
New Jersey	869	44
New Hampshire	925	28
New York	896	35.5
North Carolina	827	48
Pennsylvania	885	42
Rhode Island	877	43
South Carolina	790	50
Virginia	888	40.5

States Next Settled to Mississippi River

Alabama	964	26
Florida	889	38.5
Illinois	977	21
Indiana	860	46
Kentucky	985	17
Louisiana	975	22.5
Maine	890	37
Michigan	973	24
Mississippi	988	16
Ohio	958	27
Tennessee	999	12.5
Vermont	904	32
West Virginia	888	40.5
Wisconsin	1011	10

Top Ranking 9 States

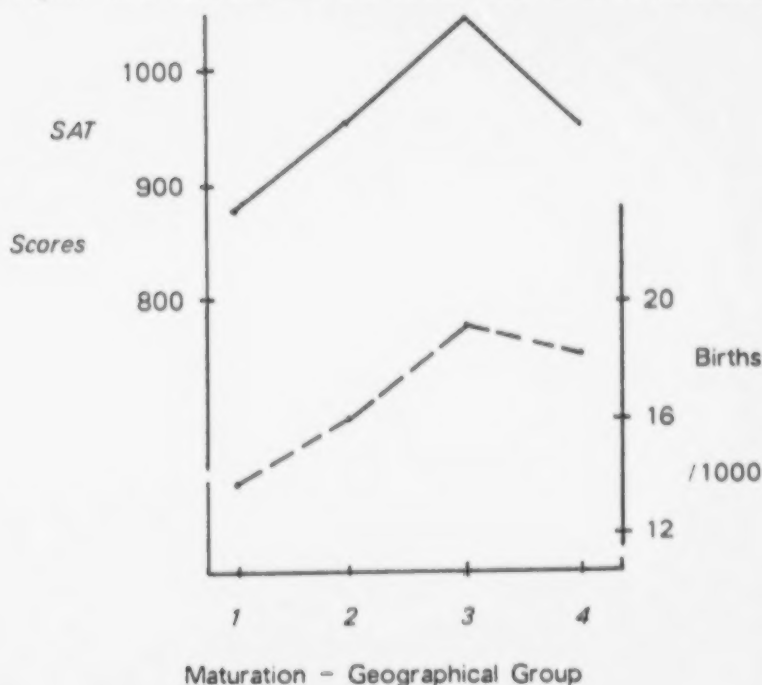
Iowa	1088	1
Kansas	1045	4.5
Minnesota	1028	7
Montana	1033	6
Nebraska	1045	4.5
North Dakota	1068	3
South Dakota	1075	2
Utah	1022	8
Wyoming	1017	9

Southern and Western Developing States

Alaska	923	29
Arizona	981	20
Arkansas	999	12.5
California	899	33
Colorado	983	18
Hawaii	857	47
Idaho	995	15
Missouri	975	22.5
Nevada	917	30
New Mexico	997	14
Oklahoma	1001	11
Oregon	908	31
Texas	868	45
Washington	982	19

<i>State Groups</i>	<i>SAT Score</i>	<i>Median Rank</i>
First 13	873	40.5
Others to Miss. River	953	24.5
Ranking top 9	1047	5.0
Southern & Western	949	20.0

Fig. 3. SAT scores (—) and Births/1000 (---) vs Maturation



data shown in Fig. 3 are consistent with the theory that maturation - motivation differences caused or produced the SAT score variations shown. Perhaps we need to wait 25-50 years for the peak motivation to shift to students in the southern and western states.

Females Mature Later

For the U.S. 1776 marks the Date of Independence, the time period in which the majority of the males of the country had matured to the "readiness" of wanting their freedom and felt capable of running their own country

By 1920 a few generations later the women felt the same urge for freedom and the opportunity to use their minds. State by state they won women's suffrage. After World War II a large portion of the women became restless in the home; they were becoming more motivated to use their minds than chase dirt.

The usual comment of the male population is that women are not "temperamentally fitted" for management; they are too emotional to handle major decisions. Women were also labelled as being immature by psychological tests. Previous tests showed females scored lower on mathematical skills and spatial abilities. Now as the females have matured more into the Mind state and are motivated to take math classes, no differences in the test scores are found. The males have a history of scoring lower on language skills, but as they have matured more into the Spirit state and are more motivated to have a friend than excel academically, their verbal test scores pass those of the females. (Powell and Steelman, 1984).

F. Joe Crosswhite, president of the National Council of Teachers of Mathematics states that he can see no evidence that girls are inferior. Patricia Casserly and Mariaine Lockheed, senior researchers of Educational Testing Service state that test analysis found no sex--linked differences in math performance.

The door is opening for women to fill new roles of leadership, and they will need a broad education. In the last two decades the number of executive women in the U.S. more than doubled from 1.4 million to 35 million, and is still climbing (Castro, 1965). The first women executives were usually wives and daughters of the owners of the companies. But the new class of women executives is climbing the corporate ladder one

rung at a time, they are moving higher with the ability to use their minds, not by family ties.

Characteristics of Body, Mind and Spirit States

We found the people's relationship with time was totally different for each phase of maturation, as did Jung (Mann et al., 1972). We agree with Jung on the characteristics of the body phase and the mind phase, but his "sensate" and the "intuitive" seem to fall together in our spirit phase. Neither did we find the future orientation characteristic of intuitive people in most fields, except perhaps in religion. The creative person seemed oriented to "now", similar to the sensate. Right now, they were eager to know if their sudden insight would work, regardless of other projects, obligations or time of day. Refer to Table 3 for a summary.

Time

How do people in different states perceive time? Body state people live in the past: "This is the way my parents did it; the way my grandparents did it; so this is the right way for me."

Mind state people live in the future: "I seek the new thought, the new way of doing things. I am willing to study for a third of my life that I might have a modern house and the latest model of one or more cars."

Spirit state people live in the present: "I am not interested in the way my ancestors did things, and I do not wish to acquire status symbols in the future. I prefer to enjoy life now."

With this one wide difference in reality alone, you can see the friction that would exist among a group of

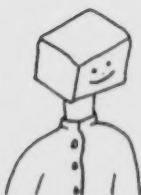
students of different realities, or students of one reality and their teacher of another.

This conflict is often spoken of as "boredom". If the activity does not match the students' reality, they are bored. Boredom becomes restlessness, sleepiness and rebellion in the classroom. You have no doubt experienced at one time or another this boredom when attending concerts of music. Body state people prefer a strong rhythm pattern. Mind state people prefer the classical, well-structured themes, intricately interwoven with melody and harmony. Spirit state people prefer music in which they can become immersed, simple arrangements with feeling or rock music.

Probably two out of these three would eventually bore you. The third would really turn you on. This inner reality is a subtle motivational force, but people have fought major wars in an effort to instate or maintain one set of realities vs another.

Education

On a cultural level we found major differences in types of education that have proven effective for people of different maturation phases:



Similar to the illustration of ice, the Body state students resist change. There is no easy way to change the ice without breaking it. The boy who has his hand cut off for theft or the woman stoned for adultery or the student who is whipped in the classroom becomes the lesson. We think of this type of teaching as being in the past.

But currently there are 835 million people, one sixth of the world's population following the Islamic religion in

Table 3 Major Reality Differences for the Body,
Mind and Spirit Phases

<i>Dominant maturation drive</i>	<i>Body (physical, emotions)</i>
Relating to people	Strong ties to blood lines.
Leadership	Father figure; physically strong men
Time	Relate to the past
Punctuality	General awareness of time
Memory	Good verbal memory, retain many facts
Art	Sculpture dominates; aliveness, naturalistic
Music	Rhythm dominates
Sports	Contest of physical strength and endurance.
Sexuality	Strong heterosexual drive, polygamy
Male/Female	Males dominate, females suppressed, patriarchal society

Mind
(reasoning, structuring)

Spirit
(intuitive, relative)

Interrelate intellectually

Friends important

Structured bureaucracy,
some form of democracy

Causal groups and
community

Lives for the future

Lives for now

Exacting and punctual

Not pressured by time

Resourcefulness stronger
than memory

Good visual memory.

Mind manipulated designs,
monumental arts adorn
architecture

Painting dominates
sensitive, ethereal,
caring, nudity

Intricately structured
compositions of melodies
and harmonies

Feeling dominates

Group games using
structured plays and rules

Spectator sports
Women enter the field.

Monogamy - a strong
family unit

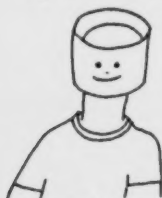
Loose relation between
sexes, homosexuality,
single parents,
divorces, polyandry

Competition between
sexes

Female leadership
develops, some
matriarchal societies

which the Sharia is the body of laws by which Islam defines and regulates itself. (Wilsher and Janmohamed, 1986). These punitive examples are typical of Islam today.

Emotions are the strong motivational force for the Body state. Preschool children will respond to your emotions either positively or negatively, but, not your logic or reasoning according to Piaget. (Pulaski, 1971)



Similar to the water illustration, the Mind state students are pliable and eager to change. They find using their minds stimulating and will tolerate all kinds of hardships in order to store knowledge for future use. Filling their minds with facts, organizing or recombining these facts into new concepts entertain these students for life.

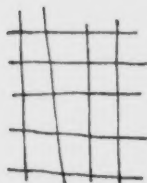
With the Mind state ego develops, competitiveness becomes a motivational stimulus. Grades, titles, honors, climbing the Mind state structure for future gains motivate the students to endure a continuous grind for years. This motivation phase we know well; we have all experienced it:



Similar to the steam (gas) illustration, the spirit state students change quickly, with a waft of the hand, a suggestion, a belief, or thought, their reality changes. These students are stimulated by tuning-in with the cosmic universe, with their friends, with certain types of music and with nature. Their outlet of creative expression is through the arts, drama, mime, music, painting, graphic and plastic arts and community living.

Spirit state students are bored with long drill periods, with accumulating knowledge for which they see no immediate use. Our model suggests a return to the basics as being a move in the wrong direction for the U.S. currently.

Education for the Spirit Phase:
The New Age for the Caucasians



Sense the inner pleasure that Ann, who has just turned six receives as she goes from closet to closet and sets everyone's shoes by pairs in a straight line. Sense the inner at-one-ness the early cave artists felt as they projected their feelings into grids on the walls of caves, or

the pride of a tribal group who erected their houses on the block system, or when the comet appeared as predicted. An awareness, an at-one-ness with the order of the universe gives an inner pleasure, a motivational drive, an urge to discover the laws and put them to use.

But this feeling is dominate only for Mind state people. The new age shifts to letting the Spirit aspect of people dominate. Perhaps in an ideal universe all three aspects Body, Mind and Spirit, would be held in balance. None of us is ready to let go of the technology the Mind state phase has brought. Yet, if an interest in Mind state education slows, the next generation will not be competent in these fields. Our challenge may be to sugar coat the Mind state educational system with Spirit state values and techniques.

Our research found the Spirit state values to be the same from the tribal groups to the most complex civilizations (Schuster and Schuster, 1979). The interest in

using the mind shifts in the Spirit phase to a concern for people, the environment and working with the inner forces of the mind. In our culture after the youth's revolutionary reaction of shedding much of the Mind state superstructure, including their clothes, letting their hair grow, ignoring materialism, the truer Spirit state values are settling in.

A prime interest of the Spirit state is a return in caring about people. Friends become of greatest importance. A community spirit develops. The Mind state competitiveness decreases. The student no longer wants to compete against his or her friends. He prefers to learn cooperatively with them. Can you see your classroom taking on these qualities? To punish one child is punishing each child in class: each student's feelings are related to the child in trouble. Understanding how a child is restimulated, how you can bring him or her out of their return to early childhood problem solving, can be a great help. (Schuster and Schuster, 1985). As you exhibit love and concern for each child, your strength as a teacher increases and your classroom becomes a community of everyone caring and helping each other. Discipline problems decrease and learning increases.

A return to nature - natural foods, natural fabrics, classes held outdoors, nature walks, a concern for every part of our environment stimulates the student of the Spirit phase. The American Indians (on the East coast and in the Mississippi valley) were in the Spirit phase as the foreigners came ashore. Much of the literature about their stories, legends and meditations is an excellent source of inspiration for how people relate to their environment, an example to all of us.

A strong feeling for floating (gaseous phase) exists for the Spirit phase. Floating ribbons are described in the art work of the earliest Egyptians (1,300 B.C.) and mentioned continuously up to the current age for Spirit state cultures. Think of the stimulating feeling of watching Tarzan fly through the trees with the greatest of ease. Currently notice in the T.V. commercials that even the automobile is floating! Suggested areas for study could be space programs, balloon races, migrating birds; we are working with a gut level feeling, one that will tend to stimulate each student if you work with it. If you try to use the structured feeling of the Mind state or the drill and fear of the Body state, according to our findings you will get more boredom, restlessness, discipline problems and absenteeism.

Working with the inner forces of the mind is a strong reality for the Spirit phase. Betting, gambling, chance games have been popular for this phase since recorded history. We are observing the growth of public lottery in the U.S. currently. Instead of the long tedious task of completing several pages of math, perhaps the students would learn more with the stimulation of drawing straws and having to complete certain problems.

Magic, spirit folk, make believe, are great to shift the attention off of the student and his or her problems into the land of creation. If the class is restless, take a few minutes for visualizing a walk in the forest where you meet Ting, the sprite that knows the answers to all math problems. The sprite tells the students if they ever have a problem they are not able to solve, to visualize walking down the very same path again until they come to this special place under the Ling tree and Ting will help them. Of course by this time the student is more relaxed, less anxious and the

answer does come to him or her. Even for adults, consulting their Highself, the contact with the Universal mind, brings unbelievable results. There is always a new trip that can be taken with the mind, and numerous positive suggestions than can be laid for the course work at hand.

The Spirit phase is the bloom period for the culture, a time when the arts flourish. A suggested project is the creative task of performing a group skit; this combines friends, creativity, and the arts; with a little imagination you can tuck the lesson to be learned right in the main theme of the skit. Sometimes periods of the creative arts can be a reward for having accomplished other more tedious learning projects.

For many tribal cultures during this phase, lessons for the community are taught through skits, "Being Honest", "Faithful to a spouse", "Caring for a pet", "Protecting a tree". Seeing the need, the elders of a community invite in a group, complete with costumes to give a lesson skit. In school the upper grades could furnish this service for the lower grades or the teachers! Exercises of this nature teach planning, organizing, disguised structural thinking, all of which are needed in a complex culture.

In general, the Spirit phase relates to "now", not to a future time or the past, but "now". Suddenly changing the plan for the day and letting the students create a spontaneous expression gives excitement to the day; you match their inner reality and learning peaks.

Since the mind is less dominate during the Spirit phase, more emphasis may have to be applied to teaching subjects like organization, planning, step procedures, etc. To make the subject more palpable, garnish it with items that appeal to the Spirit state student.

The ancient Hawaiians during their spirit phase taught celestial navigation with song. Some 200 star constellations had their rising time, latitude and season of the year all woven into song. The young navigator students were intrigued by the story and learned the song perfectly. With these accurate star charts in their heads, the ancient Hawaiians travelled the trackless Pacific for thousands of miles... and home again. (Lewis, 1974).

Spirit state people identify strongly with flowers. Planting seeds, nurturing bulbs, using flowers for decoration and motifs will have an appeal. Art history shows that flowers come dramatically forward during this phase in all types of art, and they are not prevalent during other phases.

The Spirit state phase is a polychrome period. The Body state people like the subtle colors, the Mind state people like their limited color schemes, but the Spirit state people like a profusion of all the bright colors plus lush textures. Add energy and excitement to your classroom with color.

Humor is another plus. Jokes become a form of creative thinking. Fantasy and imaginative writings stimulate the student, it seems as though the mythologies and creation stories are the product of the imaginative Spirit phase. They seem to serve the purpose of giving the people something to hold onto until their culture rises again.

For most Spirit state cultures the people follow charismatic leaders. The people are not motivated by teachers who appear superintelligent, or the teacher with a big stick, but by a teacher who invokes a strong feeling of caring. The child will work hard at the assignment to do it nice, neat and correct for a teacher

they like, one they feel cares about them. Spirit state students are stimulated by beauty and harmony, the music, the flowers, the color harmonies of the classroom and the attractive, creatively dressed teacher.

To eliminate the arts and return to the basics is like crawling into a cave and pulling the big stone in front of the entrance. No one will see the sun rise, let alone the beauty of the new age.

Educating the Aborigines

Aborigines are often seen as the "original people" from the earliest period. They appear unable to help themselves and do not make any effort to control their environment. They are usually non-aggressive and like the gypsies, feel the fruits of the land are for everyone.

The brief history we have of the Australian aborigines indicates they are a late Spirit state people living in a dream world of myths. As a culture they have experienced other phases of maturation and can tell you how great their people were at one time. They are a people who have no doubt, like other cultures through the phase of creating an expanded root system from their gene pool, bearing and supporting as many as 12 to 24 children per family. They are a people who have in the past geared up energy to respond to the insistence of their minds to create structure. The structure is not the visible materialism we know today. Their history tells us it consisted of a complex set of laws and observances strictly applied and one of the most complex kinship systems in the world.

As usual the arts remain to speak to us of the aborigines thoughts and feelings. The large number of beautiful and complex paintings in the interior surface

of caves, large ground paintings for ceremonies, the intricate design creations found on numerous materials, each tells us of the grandeur and the influence of their Mind state phase on the culture in the past. Now the chiefs of the Body state are gone, the rulers of the Mind state have disappeared, and we have the elders with their wisdom and influence over the unseen world to relate to.

How do we educate the aborigines? Our findings suggest that we have to start where the people are and match their realities. Recognizing their phase of maturation gives us a great deal of knowledge. Second we need to come to a soul-searching decision: why are we educating them? If we feel by teaching the children how to read and write, they will change their culture into being one with ours, our model indicates we may have some disappointments ahead. The people's motivational drive is dictating to them a different life style.

If we are willing to work with the people's reality and establish an understanding between the two cultures, who wish to inhabit the same piece of land, we may be starting with workable attitudes. Our study indicates each culture will continue with the motivational drive of its phase in spite of educational programs or being moved to another country as were the Black slaves (Diallo, 1983). Similar to the United States, the blacks in Brazil, Latin America and even Cuba, except for sports, are confined to domestic work and other servile tasks (Diallo, 1983). Change will come with people's internal maturation, not with external influences. A tribal group desires to keep its identity, its set of values and they do not see our values as being better. We might look at their children tolerating infections, and feel something should be done to help the children. At the same time the tribal people might look at the expressions on our

Mind state children's faces and feel some one should have more time and patience for these children.

The Mind state phase is the shortest phase of the cycle. Who can say which set of values is best? Each culture is working out the positive and negative aspects of its current motivational drive.

If we can see an educational program as a bridge between two cultures, what exchange of knowledge is necessary for both to reside in one area harmoniously? Our first thought is we need to communicate, but who should learn whose language? The one that has the most to gain will put the most effort into the task. If the Mind state culture sees the tribal people as possible labor, they may have to take the initiative. If the tribal people see the Mind state community as a source of employment and a future for their children, they are more motivated to cooperatively work out an education program.

In our research we constantly found that change started at the top. Searching among the leaders of the community you will find a few people who will match your interest in bridging the gap between the two populations. Friendships are made slowly. Verbal or written agreements are not taken too seriously by people of either the Body state or the Spirit state phase. Start with an adult education program. Let the adults enjoy the experience of communicating and interrelating. If this is a positive experience the adult leaders can help pick possible teachers among their young people and together you share life styles, values, the arts, the concerns for each other.

One motivational drive is of no more value to people than another, only different. To build a desire

among the children and the adults for learning (Mind state) the community needs to see a value and a joy which they will pass on to the children. All the time we must keep in mind the aborigines' set of values, a concern for people, the elements of their environment, their intuitive world within. If we ruthlessly clear an area of trees we can't expect the aborigines to look at the act in the same way a Mind state culture would. Education will have to be couched in the culture's framework of reality and values in a way only the young aborigines' teachers would know.

Seagrim and Lendon (1980) made a series of studies (Hermannsburg Project) of the aboriginal children of Central Australian origin to learn if the aboriginal children were capable of matching white Australian children in the thought processes identified by Piaget as being necessary for success in the modern Western world. The main finding of the study was that the aboriginal children of central Australian origin are just as capable at a comparable age as the white Australian children on Piaget's tests of logical thinking.

Yet when we visited the Australian Department of Education (1982) the people remarked, "Just this morning we asked, is there anything left that we have not considered?" The general feeling was that the schools were not making the progress in educating the aborigine children that the department had hoped. The problem is in creating an atmosphere that entices the children to want to learn the material presented. Think of the many areas in which you have the ability to work, but in how few you feel the motivation to seriously apply yourself.

A report by the National Aboriginal Education committee (1981) of suggestions made by students at the Fifth National Aboriginal Education Conference (1980)

supports our model of cultural change. Their recommendations were: Teachers becoming involved with aboriginal parent groups; Listen to aboriginal parents and discuss the special needs of aboriginal students at the local level; More aboriginal teachers, assistant teachers and more employment of aboriginal people within the educational system at all levels; The education system should not only provide students with basic skills, but should be more aware of the individuals; Should have more aboriginal people as guest speakers to talk about the real aboriginal way of life, their different life styles and their way of thinking; Teachers need to be aware of the day to day problems of students in their care; Suitable reading material on aboriginals; In another words the aborigines' reality is of utmost importance to them, just as our reality is important to us.

Educating Tribal People

A study of tribal people along the Amazon, in New Guinea, parts of India, Thailand, Cambodia, South America indicated any large land area was occupied by tribes of different maturation phases. The different phases of maturation gives different realities to the people, thus different life styles which is one factor that sets the groups apart as different tribes, and causes constant conflict between them. Australia, which has over 100 different ethnic groups has tried to cope with these differences by giving "self-management" to each group. Each group makes decisions, plans, choices according to their reality; Australia seems to be making substantial progress working with people.

Recognizing the age or maturation phase of a culture can best be approximated by the birth rate per thousand population, similar to counting tree rings to learn the age of a tree. (See Table 1.) A very large birth rate, 8 to 18 children per family, indicates a Body state

culture, a physically strong, emotional people, but of whom only a small percent are interested in Mind state education. People with a medium size family of 3 to 4 children, especially those who seem to wish to migrate to commercial centers, are eager to learn and can be aggressive in an effort to accomplish their goals. Or they will endure hardships in little shanty town arrangements near to the cities in hopes of working their way into the new life. Sending them back to their homeland only increases their frustration and renews their determination. Perhaps with leadership and a "self-management" policy this early Mind state group could be informed of educational requirements and opportunities, better housing possibilities, cooperative transportation and child care arrangements, hygiene that would help them bridge the change from the extended family to functioning in the structured Mind state. Many countries maturing into the Mind state speak of this ring of poverty outside their cities. It is sometimes better known as the "rural exodus". Numerous cities in India, Africa and other places are being descended upon by the youth from rural areas seeking a new life style. (Johnson, 1983; Scofield, 1981) Again education starts with the first small percent of people who show a readiness for Mind state learning, usually in the form of adult education. Let them show you the way to introduce it to the younger people of the tribe.

Educating the people who have matured into the Mind state is much easier than for the tribes who have matured into the Spirit state. The Mind state students are motivated to use their minds and eager to learn, eager for the new life style and new set of values.

The Gambell, Alaska school is an excellent example of what can be accomplished by a teacher sensitive to his student's reality and the belief that educators must

correlate teaching styles and learning styles. George Guthridge's school (1984) Gambell, Alaska is located on an island in the far North end of the Bering Sea. His students were Siberian-Yupik Eskimos using English as their second language. His project, for 10 of the 36 students enrolled in school, was to participate in the Future Problem Solving (FPS) program, an international competition which combines research, writing, logic, creative thinking and group interaction skills.

For the past decade or so numerous Eskimos have been leaving their traditional way of life and moving into the little towns, living in corrugated metal houses. As recently as three years ago Gambell was known for its student absenteeism, often a disregard for learning and assaults on teachers.

Guthridge referred to the young people as being a "newly literate" culture. This past year the students won numerous state and several international FPS awards. Some students were so motivated that they studied virtually non-stop 72 hours without sleep. One ninth grade girl, using a dictionary, deciphered almost word for word scientific material on nuclear waste. She became a national champion. "Newly literate" or newly Mind state students are highly motivated to learn and will work hard under encouraging conditions.

Stratified Society

In a stratified society you may have students from each of these three levels of maturation. (See Fig. 1) Generation gaps are especially noticed if the whole culture is changing from one phase of growth to another. Usually in any one locality only two phases will intermingle because the people themselves feel more comfortable with people of like realities and move accordingly. But you may encounter the foreign child who has

been adopted into a local family. The Ethiopian child that shows up in your classroom will be more comfortable and inspired to learn by an entirely different set of realities, than perhaps one from Japan.

And how about the teacher, are you part of the stratification? Do you match the majority of your students? To obtain a feel for where your students are on the maturation scale, field a few choices. "Would you rather finish up your science lesson today so you can have more time on the computer tomorrow, or would you rather create a skit for the First grade to help teach the children not to tease their pets?" Do you get a unanimous preference or two different choices? You will gradually become aware of the maturation level or levels of your class.

As a people of a family, a community we have always had to adjust to the young and old, the very young and the very old. With an awareness and understanding that some generations and some cultures feel differently about almost everything in life than we ourselves, we can creatively blend realities into a more interesting fabric.

Summary

A study of the arts and correlated histories of numerous cultures suggested a model for cultural change. The model consists of cycles of growth phases implemented by the dominate motivational drive of the people (Body, Mind, Spirit). Maturation moves across a geographic area giving different growth phases to different areas. Females mature through the same phases several generations later than the males. For each of the maturation phases we found the people had entirely different realities. The adjustment of the educational system

to each phase requires constant readiness for change. The stratification of the student phases and their realities in the classroom are a challenge to the teachers. The main theme of this discussion is to note the changing realities for each phase and how education can optimally adjust to each.

The music, drama, imagery, visualization, the teacher as an authority on his or her subject, learning a joy, learning organized for the student--are not these the characteristics of SALT? History repeating itself? We thank Dr. Lozanov for bringing it to our awareness.

SALT is not a fad or new fix; it is harmonizing teaching with the innate characteristics of the Spirit phase or the New Age. We feel it is here to stay for numerous generations. The interested reader will want to study Table 3.

*** *** ***

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**All Stars to Center Stage:
A Pilot Study of Accelerative Learning
in the School of Business**

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Abstract. A study using administrative policy students taking the capstone course in a School of Business was conducted to test the value of accelerative learning techniques developed by members of the national organization of S.A.L.T. The specific techniques of relaxation, synchronized music and phrasing, and whole brain learning were employed for treatment with comparisons of students' achievement scores, case analyses, and objective as well as essay test scores used for the measurement of results. The results indicate a marked improvement in student learning, morale and self-confidence when using selected optimal learning techniques. Of special interest to this researcher was the marked enhancement of the students' critical thinking skills, and their grace and clarity of expressing those marvelous thoughts in the form of creative solutions to complex business problems.

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PROLOGUE

The worn cover of the dusty journal was slightly bent and tattered from frequent use. One could easily see that it had been cradled and cherished by its creator. Grandfather had rarely mentioned it during our frequent visits in his study located in the corner of the remodeled attic of the old ranch house. How long ago that seems and how I cherish those wonderful moments of my youth. In my mind's eye I remember seeing him with the journal laying open before him on his big roll-top desk. With his fountain pen grasped firmly in his large, gnarled hand he would gaze through the window out over the river as if peering into some hidden recess of his memory. Then with his face held close to the opened pages he would begin to write focusing only upon his thoughts. All else was excluded during these moments and I knew better than to interrupt. Instead, I would slip back downstairs and leave him to his work.

To say that I was excited to discover the journal is quite an understatement. As I gently lifted it from its long resting place my heartbeat increased its tempo as if keeping pace with the 18th century flute concertos I used in my experiential optimal learning classes in the Business School at Eastern Washington University.

Introduction

Students taking my administrative policy course are required to keep a record of their perceptions as these relate to the class, reading assignments, and learning activities. This journal, as I refer to it, provides students a private media to share their learning experiences with me. While the students may write about any academic or personal topic they choose the main focus is

their individual progress toward completing the multiple learning objectives of the course.

As part of my preparation for future classes, I also keep journals—one for each subject taught in a given quarter. Writing about my experiences in the classroom, my observations and reactions to student input has provided me with an important data base of ideas and measures of student competencies. This information packet is the source of the statistical comparisons that are part of this paper. The data were part of a pilot project to compare accelerative versus traditional teaching pedagogies and the subsequent impacts on students' learning.

In the past several decades many researchers have investigated the relationship between learning and how the brain functions. Several of these mainstream studies have been presented at the annual S.A.L.T. conference while others have appeared in the S.A.L.T. journal. For example, James Hand and Barbara Stein have a three-part article that appeared in the Spring, Fall, and Winter issues of 1986. They support the brain-function-and-learning relationship as do the many notable researchers whose work they've referenced. People such as Cowie, Dunant, Galaburda, Fordor Garmon, Gazzaniga, Geschwind, Harshman, Hart, Holden, Hyden, Joynt, Kimura, Kocel, Levy, MacLean, McAuliffe, McGlone, Molfese, Nadel, Ornstein, Pribram, Sheldrake, Stevens, Trotter, and Witelson. At approximately the same release time as the Hand and Stein article, however, a cogent article by Terence Hines (1987) dealing with brain functions and the implications for management education concluded, "At this point, it is natural to inquire as to what relevance the actual findings about hemispheric differences in particular (and brain function in general) have for management theory, research, and practice. The answer,

unfortunately, is none." Mr. Hines' list of references include many notable researchers: Agor, Blakeslee, Bradshaw and Nettleton, Bryden, Bunderson, Coltheart, Corballis, Davies, Doktor, Donchin, and McCarthy, Edwards, Gardner, Gazzaniga, Gevins, Gorovitz, Harnad, Decaen, Hellige, Herrmann, Kaminski-da-Roza, Lassen and Skihoj, Marin, McKean, Mintzberg, Nottebohm, Pareds and Hebrburn, Kobinaon and Solomon, Rothschild and Thorson, Saarlman, Sergeant, Sidtis, Springer, Taggart and Kroeck, Weisstein, Wettheim, Young and Zdenek.

It is not the purpose of the present article to review the work of these researchers or to address their many and varied differences, beliefs, or expectations about the usefulness of brain-function-research and real world application's. I merely want to make note of the researchers in each of the separate camps. Separating fact from fiction is a major challenge faced by those of us who are involved with accelerative learning.

The purpose of this paper is to set down the reflections, observations, and statistical analysis obtained from a pilot study of accelerative learning and from my own internal struggles with the issue of the applicability of brain research to the real world of business. The main focus of the pilot study was to answer the question, "Have accelerative learning techniques enhanced student learning when used in a School of Business administrative policy class?" Basic to this question was whether or not my use of such techniques actually made a difference. This is an important question since the techniques are based on how the brain functions and how this functioning impacts individual learning curves. Perhaps my students learn in spite of their professor. Perhaps meaningful learning does not take place at all.

Or, worse yet as suggested by Alex Beam (1985, pp. 54-70), "Hollow organizations are staffed with maze bright college graduates who cannot think, write, (or) act." His statement is a blatant one suggesting that business students are not prepared for the real world of corporate life. They have not learned how to learn. Perhaps, business students are being taught to be maze bright, and this prohibits their developing critical, systematic thinking skills as well as acquiring the other requisite skills and abilities required to become successful managers. My desire to address these issues led me through the research experiences that are described below.

Beliefs, Assumptions, and Promises

Based on more than 20 years of college teaching, I have reached the conclusion that many business students prefer a left brain or highly structured approach to learning because it's safer. Students seem to be saying, "Tell me what to do, I'll do it, and then you will (must) give me a high grade because I did my best and you told me to do it." In other words, many students think a class is designed to give them answers in the form of facts that they dutifully record in their notebooks as if they were professional stenographers. Too frequently within the Business School, the notes of the professor become those of the students without passing through the minds of either. At the end of the term students appear to have a "mind dump," disgorging most of their rote-learned materials. This has generally been their experience with the traditional lecture courses they have taken. Many have simply not taken the time, nor have they been given the opportunity, to think about those recorded facts. Consequently, students leave the classroom with low motivation and lower ability to think critically about issues, facts and theories. They do learn to find their way through the "maze" of classes, jumping

all hurdles placed in their paths like so many primates in Paul MacLean's laboratory.*

The ability to think critically about issues begins with facts. Facts are assembled, clustered into similar types to form patterns, and stored until they are needed like so many pieces in a dynamic, changing, multi-dimensional puzzle. With training, practice, and attention paid to the techniques of accelerative learning, some researchers believe the brain is able to call up appropriate facts when these are needed to resolve complex problems or to turn-around a given business situation. In short, many students are capable of learning to recognize, create, and implement strategies that pinpoint and take advantage of business-enhancing opportunities if given the chance and properly motivated. These students are more than "maze bright," they are capable decision-makers. Or, as Win Wenger (1983) writes "What matters is not what's taught but what's learned (and) what's learned is not so much a function of what's expressed TO the student as a function of what's expressed BY the student." Students must be actively involved in the learning process as participants and facilitators of their own learning. They must assume responsibility for their own training and development. To best accomplish this, each student should be made aware of his own individual learning style. They must view the professor as a coordinator of learning and not simply as a teacher who fills their notebooks with facts. In other words, teaching is only part of the learning process.

* Paul MacLean is chief of the Laboratory of Brain Evolution and and Behavior at the National Institute of Mental Health.

All Students to Center Stage

Peter Drucker (1967) writes, "Managers (and students aspiring to become managers) had better assume that the skills, knowledge, and tools they will have to master and apply fifteen years hence are going to be different and new...and only they themselves can take responsibility for the necessary learning and relearning, and for directing themselves. (After-all) not a single executive was born effective...All the effective ones had to learn it." Who then is responsible for student-learning and how might they proceed?

The responsibility for learning lies with the student. However, s/he (The Star) must be placed within an appropriate classroom learning environment (The Stage) in order to acquire those human attributes associated with successful managers such as critical thinking, communication skills, leadership, problem solving, directing, delegating, and so forth. Given the learning environment, each student, with some gentle prodding, decides what s/he needs to know and then learns it. I use the term "gentle prodding" to imply the notion that a faculty member has a dual role: as a mentor and as an occasional tormentor, but only in the positive sense. As Dr. Gordon T. Moore, director of the New Pathway curriculum format of the Harvard Medical School says ("A New Way," 1986), "The bottom line is very simple. The less you (as the learning facilitator) say, the more students do, and the more you say, the less they do. That's been a hard lesson to learn."

Schuster and Gritton (1986) have refined accelerative learning techniques that are easily adapted to business administration courses. I adopted a rainbow of ideas from them and others, too numerous to list here, who have contributed to the literature dealing with accelera-

tive learning to see if I could tap the full potential of all my students. One major key to the process is the elimination of stress and tension on the part of student learners.

Methodology and Background Information

Business students enrolled in each of two administrative policy courses during Fall Quarter 1985 were the subjects of this pilot study to test the effects of selected learning techniques on student-learning as measured by objective test scores, written case analyses and summaries, oral presentations, class participation, and objective as well as essay test grades. Teacher evaluations by students were also compared to determine any perceived student differences of the teacher's effectiveness in teaching the two sections of the "capstone" course, a course designed for senior students majoring in business administration.

The objective tests were used to determine students' understanding of the theory, concepts, and principles of strategic management and business policy. Case summaries and oral presentations of cases were used to determine how well students were able to identify problems, causes, solutions and means to implement these solutions in resolving complex problems. Class participation was evaluated using the same point system developed to evaluate case write-ups and presentations. These evaluative rating formats were also used by students to increase their awareness of what was expected of them and to help them apply the holistic strategic management model in analyzing cases, pinpointing strengths and weaknesses, and developing profitable opportunities for the organization under investigation.

Administrative policy is a class that combines strategic management and business policy. The authors of the textbook (Pearce and Robinson, 1985) used in the class define strategic management "as the set of decisions and actions resulting in formulation and implementation of strategies designed to achieve the objectives of an organization." As such it involves determining mission, purpose, philosophy, sense of direction and long range objectives of companies and the means to achieve these important ends. "A strategy reflects a company's awareness of how to compete, against whom, when, where, and for what," according to Pearce and Robinson. Students learn to recognize, identify, and resolve complex business problems based on the evidence presented in lengthy cases that deal with companies such as Anheuser-Busch, Coca-Cola, Holiday Inns, Merrill Lynch, Safeway Stores and Wendy's. Thus, the policy portion requires application of theory learned in the strategic management segment of the course to cases that are based on Fortune 500 companies.

By combining policy and strategy into administrative policy as a class, Schools of Business generally attempt to introduce students to the real world of business using a holistic model that provides ample opportunity to practice developing strategic plans and long term objectives. Then, students develop tactical means for implementing action-packed game plans that culminate in the successful achievement of these long term objectives. Thus, planning takes place from the top down through the organization while implementation is from the bottom up in a never-ending cycle of business related decisions made under varying degrees of risk and uncertainty. A major learning objective of the course is to improve each student's managerial and technical competencies. These competencies include, but are not limited to the following: 1) creativity or the

ability to come up with imaginative solutions in complex business situations, 2) motivation and work standards or the desire to do a good job, 3) problem analysis or effectiveness in seeking out pertinent data and determining the causes of business problems, and 4) judgment or ability to reach logical conclusions based on the evidence available under conditions of risk and uncertainty.

Administrative policy is the last required class business students take before graduation. It is a course designed to provide ample opportunity for students to demonstrate what they have learned in all their required business courses such as accounting, finance, marketing, statistics, economics, organizational behavior, production, and management information systems.

One of two classes taught Spring quarter 1985 was used as the control group. These students were taught in the traditional manner using lectures, case analysis and group presentation of cases. The other section was deemed the experimental group, the determination being made by a simple coin toss to insure additional randomness. The control group of students analyzed and presented cases, and they took scheduled mid-term and final exams to test for cognitive understanding of strategic management and business policy. The experimental group also took tests; however, relaxation exercises, synchronized music and phrasing, journal assignments, mind mapping, vision quests and affirmations, and hand dancing were a part of the daily class routine. Each group of students was told, and occasionally "gently reminded," that the responsibility for learning was theirs. The synchronizing of business vocabulary words, theories, concepts, principles, and decision making techniques was used to review mass amounts of subject content taken by the students as part and parcel of

their business program graduation requirements. From this collage of information and facts students were able to pinpoint words and ideas that were a bit fuzzy to them. They would then take responsibility to learn or relearn that particular theory, term or principle by asking questions in class or in their journals, by asking a member of their study group, or by reviewing the textbook or other source books available in the business section of the university library. The use of music and phrasing seemed to reduce stress and help students synthesize the subject matter.

According to student feedback provided during their evaluation of the class and professor, the journals proved to be a major learning vehicle where systematic thinking and clarity in expression were honed. Non-stop writing exercises were used to break-through barriers that impeded understanding. Students wrote in their journals about three times each week for at least ten minutes or until approximately one page was filled. Every two weeks the journals were read by me to check for student understanding of subject matter, to determine if they had any specific questions or concerns, and to nominally evaluate their progress toward the accomplishment of course objectives. Journal entries were read and responded to in a positive fashion at all times.

The mind mapping was used to cluster information into manageable, like types of subject content to enhance student understanding. They also proved useful in stimulating the creative thinking that is required to develop diverse yet practical solutions to the many and varied business problems found in each case. On the other hand, the vision quests were for the students' own edification. In a sense, these visions or dreams were a means for students to set long term career

objectives for themselves and to think about the means of achieving those goals. Positive statements written in their journals by the students affirmed the importance of individual student goals, single group goals needed in order to solve the cases under investigation, and the direction the class was taking as everyone worked to achieve the learning objectives.

The hand-dancing was used to break the ice each time a new group was formed. It was also used to energize the students and establish a positive attitude toward learning the required skills, knowledge and abilities that successful business administrators must possess in order to maximize the utilization of scarce resources in their firms.

The control class was lectured to while traditional lectures were minimized throughout the quarter with the experimental group. Each group or class of students had been randomly assigned to their respective sections during the course of normal registration. The control group (N=19) and the experimental or test group (N=16) were all seniors majoring in business administration at Eastern Washington University, an AACSB-accredited School of Business since 1975.

The first day of class, the test group was introduced to what I alternately call S.A.L.T. methods, or experimental, accelerative, and optimal learning techniques. They were told what they would learn and how I would approach each class day. With environmental music playing Solitudes - "Dawn by a Gentle Stream", I led them through a visualization- relaxation exercise. This became known by each student as their 60-Second Vacation to some favorite spot selected by them. I explained how successful they would be and how quickly they would master the strategic management planning process.

During this and succeeding classes I also discussed with the students how the brain used patterning to assimilate and store information for retrieval later when the knowledge or information was needed for them to analyze complex case studies, to resolve problems or to create business opportunities. They were told that business problems are simply a manager's opportunities to enhance the firm's operational effectiveness and the bottom line. Thus, positive thinking was a major theme throughout the quarter. Constructive feedback was used to reaffirm the course content that the students had learned as well as to reaffirm the processes of applying that knowledge. The suggestions were laced with positive feedback to further enhance individual learning. Learning seemed to take place in a synergetic fashion triggered by suggestions. For the class, these suggestions were essential elements in the accelerative learning environment developed throughout the quarter. Of interest to me was how quickly business students learned to act on suggestions. Earlier in the quarter they seemed uncertain about how to use the facts, theories, concepts, and principles that make up the subject matter of their prerequisite business courses. By the end of the term most students did not need to have suggestive application of theory and concepts made because they had learned to create a vision of alternative courses of action on their own.

Visual, auditory, and experiential or kinesthetic pedagogies were incorporated on a daily basis to help maximize each student's understanding of the strategic-management-decision-making process. For example, journals, overheads, handouts, and mind maps served as vision learning aids while lectures, readings, discussions, and tapes were designed for the auditory learners. Finally, role playing and active participation in simulated business games such as in-basket exercises and assessment centers allowed students to learn by doing.

All of these pedagogies were combined by the students during their presentation of cases.

Two critical questions often addressed by researchers in the strategic management and policy area were used to guide students' thinking throughout the quarter, namely, 1) "What has to be considered?", and 2) "Who decides what, under which circumstances, and how do they decide?" While these encompassing questions were not answered specifically, the students soon accepted the responsibility of deciding for themselves what they had to learn in order to one day be able to answer them, a day that would come in the future when they were employed as business managers.

The second and ensuing days of class for the experimental group began with relaxation - visualization exercise, sometimes using the Solitude music while at other times I used Daniel Kobialka's "Dream Passage" or environmental music of the ocean, sailboats, meadows, or thunderstorms. The students enjoyed the relaxation and the timely playing of "classical" music during select portions of the class; especially as we later engaged in process and free style writing, discussions, and case presentations. Our discussions were viewed much like a casual, social conversation between and among friends. Stress, normally felt by students, as described by students in their journals, was virtually eliminated midway through the quarter.

Results and Discussion

Following Campbell and Stanley (1969), a quasi-experimental design was used in this pilot study since there were some uncontrolled variables such as class member dedication or motivational levels, student perceptions and patterning styles, time of day that the particular class met, motivational levels, student perceptions and pat-

turning the dependent variable, i.e., points earned on each of the graded items used to measure student achievement.

As Campbell and Stanley point out, training evaluation has two main foci. First is the identification of criteria measures that are reliable and relevant outcomes resulting from training. The second step involves the design of experimental conditions from which these criteria measures are collected. This latter point of focus is the area of experimental design that enables researchers to determine whether the training objectives met were the result of the experimental applications.

Performance measures are taken throughout the training session and at the end of the training session. An important design objective is the control of extraneous variables so they do not contaminate the experiment. I wanted to isolate the training being applied in order to determine the extent that it influences performance as measured by selected criteria measures such as knowledge of strategic management theory, ability to analyze financial data, or the ability to design strategic plans of action that will enable businesses to achieve well positioned long-term objectives that are defined in measurable terms. A time series design enabled me to do this.

Researchers must contend with factors that may adversely affect both internal and external validity. Normally, the researcher will rely on one of several quasi-experimental designs previously validated by earlier experimental researchers such as Dunnette, Solomon and so forth. I simply used Campbell and Stanley's "Time-Series Experiment." It calls for a time series of periodic measurements and the introduction of some experimental change, the experimental change being accelerative

learning techniques in this case. The design of pre-testing was not selected in order to eliminate possible testing bias being introduced before training was undertaken. In this way, no Hawthorne Effect was present and any change in business skills, knowledge, and abilities was deemed attributable to the teaching pedagogies under investigation.

See Table 1 for the analyses. ANOVA's and cross tabulations were run using SPSS to test for significance, at the .05 level or above, each of the following comparisons:

1. Differences between the total scores earned by men and women within each group were tested. No significant differences appeared; however, women received slightly higher total points when compared to the men in their group.
2. There was a significant difference (at the .004 level) between total points earned by the experimental group as compared with the control group. Grouping had a significant impact on points earned for total class assignments with less than 1/2 of one percent (.004%) chance of error if the null hypothesis was rejected. *Membership in the experimental group is statistically significant as a predictor of class participation points earned, mid-term and final exam points earned, and case presentation points earned. The application of accelerative learning techniques produced a higher level of student learning than the traditional methods used with the control group during this pilot study.*
3. The letter grades assigned to students at the end of the quarter indicate no significant differences between the experimental and control group, nor were there any differences between men vs women, either within groups or between groups. The

Table 1. Criteria used vs. F-ratios and significance levels

<i>Criterion</i>	<i>F</i>	<i>p</i>
<i>Midterm</i>		
Sex	0.482	0.493
Groups	2.360	0.135
<i>Total Points</i>		
Sex	0.896	0.351
Groups	9.363	0.004
<i>Final</i>		
Sex	0.529	0.472
Groups	29.634	0.042
<i>Case Presentation</i>		
Sex	0.038	0.847
Groups	18.058	0.042
<i>Class Participation</i>		
Sex	1.197	0.282
Groups	12.293	0.001
<i>Grade Points</i>		
Sex	2.746	0.110
Groups	1.243	0.276

reason for this was the use of different curves to assign letter grades based on relative points earned within respective student groupings, that is, experi-

mental or control. Students should not be unduly penalized for being a part of a pilot study testing the use of accelerative learning techniques. See Figure 1.

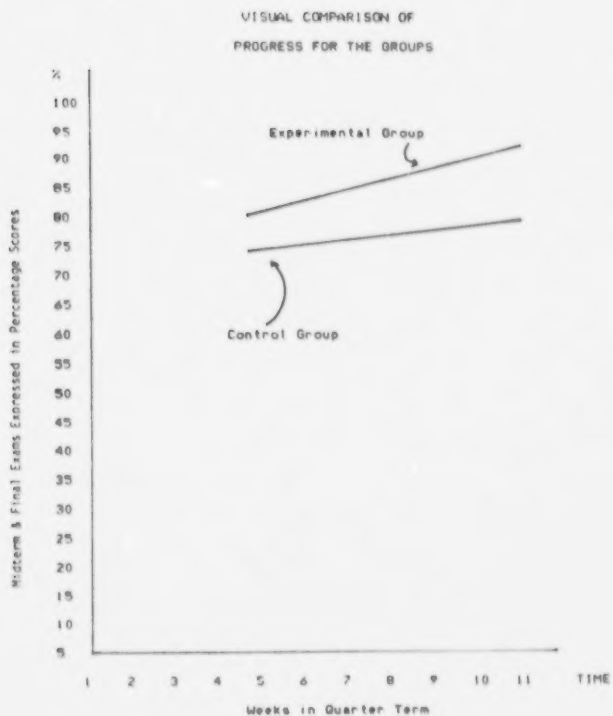
- 4 The Department of Management at Eastern Washington University has adopted a two-part student evaluation of teaching effectiveness form using a 1-5 Likert type scale. One part asks students to "Evaluate course subject matter," that is, what you learned. The other asks students to "Evaluate the teaching effectiveness of the instructor." Student responses to each part of the teacher evaluation forms are significantly different between classes. That is, there is a significant difference between the evaluation of course subject matter for the control and experimental groups. And, there is a significant difference between observed frequencies of both the control and experimental groups for evaluation of teaching effectiveness. Membership in a group is sufficient to use in predicting 1) How much students perceived they learned in the course and 2) How much students perceived the teacher to be helpful to them during the course. The experimental group gave significantly higher ratings for material learned and for teaching effectiveness than did the control group.

Summary and Recommendations for Further Study

The results of this study suggest that accelerative learning is preferred by students, that students learned more in the capstone course when this method was employed, and that students were made more aware of the control and responsibility they have over their own learning and development.

At the end of the course individual students were able to identify what they knew and to make lists of what they would know before leaving the university.

Figure 1. Exam scores for the 2 groups during the quarter



They had assumed responsibility for their own learning and development. Throughout the quarter students participated in job-performance-related-simulations. These exercises were designed to reflect the weekly and monthly activities of top level management involved with strategic planning using materials supplied in the case portion of Pearce and Robinson's textbook. Computer games are also available but were not a part of this pilot study.

As I reflect back on the class, I know that students from the experimental group increased their oral and written communication skills. They demonstrated the ability to make persuasive, clear presentations based on facts and analysis. And, they were able to identify problems, to pinpoint causes of these problems, and to develop practical solutions because they learned to apply theory to practice. In short, they developed or fine-tuned those human attributes that make business managers effective and efficient.

Additional studies need to be done in a wide variety of courses with different student mixes. Larger groups may not have the same results as the smaller groups making up the control and experimental group used in this research study. Larger groups may make a difference. Demographic characteristics of students can also impact learning with or without the use of accelerative methods. These are just a few of the possible studies and issues that need to be addressed in future research efforts.

One thing seems quite clear, the above methods worked for me. It has also worked for a growing number of faculty across the country in varied disciplines including statistics, accounting, writing, English, and foreign languages. Stress is too frequently used to moti-

vate students and is a short-run approach. Perhaps it is time for those of us involved with training managers to concentrate on the longer time period, a time of life-long learning is one method of accomplishing this.

Concluding Remarks

Regardless of the approach used in setting up a learning environment that addresses critical thinking and other managerial skills, there does not appear to be a fool-proof way to teach students to be creative thinkers. What does appear certain to me, however, is that critical thinking can be learned. And, it appears equally clear to me that faculty members can be valuable catalysts during this learning process if they will be more flexible in the way they approach the learning process. It's time for faculty to stop teaching their disciplines using the traditional passive lecture and time for them to begin thinking critically about the learning process as an active one with the student at center stage. That is, the student is the STAR and the faculty member a combination of supporting actor, director, and producer of accelerative learning environments. Perhaps it is time to say to students, "All stars to center stage!" A time to create a stress-free learning environment using accelerative learning techniques to bring out the genius that so often lies dormant in the brains of many soon-to-be "maze-bright college graduates who cannot think, write, (or) act."

If students experience internally all their senses, and if educators come to realize the benefits of relaxation, visualization, and other stress reduction exercises in maintaining healthy minds and bodies, then perhaps management education will be more cost effective. If we can trick the brain into thinking it's having fun, it will do some pretty amazing things. The next time you teach a class try treating them as you would a loved one. The

trust, confidence, and level of motivation created will truly amaze you. This positive spirit of cooperation between you and your students will enable you to orchestrate their learning in preparation for careers and life.

To learn administrative policy techniques, skills, and abilities, a manager or student needs both the knowledge of content material and the experience of putting theory into practice. Consequently, to develop the full potential of students the emphasis should be on creating a learning environment and the kinds of experiences that can be nurtured within that environment. You will perhaps invent new ways to accomplish what my student accomplished. They discovered, 1) that they learn best when they are actively involved in the learning experience; 2) that each concept has to be experienced or discovered by them if it is to be internalized and change their behavior; and (3) that commitment to learning is maximized when they are responsible for setting both their own learning objectives and the means to achieve them.

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SALT in the First Grade Classroom

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Abstract. The authors describe the use of SALT to teach reading in a regular first grade class. They wanted to determine if SALT could be implemented in a regular class of young children on a daily basis for an extended period of time. Thirteen first graders were taught basal reader lessons using all the SALT components--physical relaxation, mental relaxation, suggestive set-up, preview, passive review, dramatic presentation, activation, elaboration, and tests. End-of-year achievement tests, administered approximately 6 months after SALT was begun, showed a mean percentile score of 73.5 on the reading section of the test. Teacher observations indicated the method was received favorably by students.

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After doing research on the SALT method for her dissertation, one of the authors wanted to implement the method in her first grade class. In looking at the literature, no detailed accounts of such an implementation were found. Most of the elementary groups described in the literature were small, or they were assembled only for research purposes. There was little or no discussion of classroom

organization and management issues when implementing SALT techniques in a traditional classroom setting. Our primary purpose in this situation was not research, but the application of SALT to such a setting.

The Early Learning Center, where the authors implemented SALT to teach reading in first grade, is the laboratory school for Berry College. Berry College is a private institution with approximately 1500 students and offers bachelor's degrees in 36 areas, master's and specialist degrees in education, and a master's degree in business. It is located on the outskirts of Rome, Georgia, approximately halfway between Chattanooga, Tennessee, and Atlanta, Georgia.

The Early Learning Center was established 10 years ago as an American version of a British Infant School. Emphasis is placed on having a variety of activities which the children enjoy. The school has five teachers in grades K-5 and about 80 students. The students come from varied socio-economic backgrounds, and a majority come from outside the Berry College community.

The reading class in question was a fairly typical situation with students whose range of reading abilities called for four instructional groups. Since there was one teacher and one aide, two of the groups had to have activities which the students could do without direct adult supervision.

Although there were 21 students in the first grade homeroom, cross-grade grouping reduced the number to 13 students in reading. When school began in late August, the 11 students in attendance were

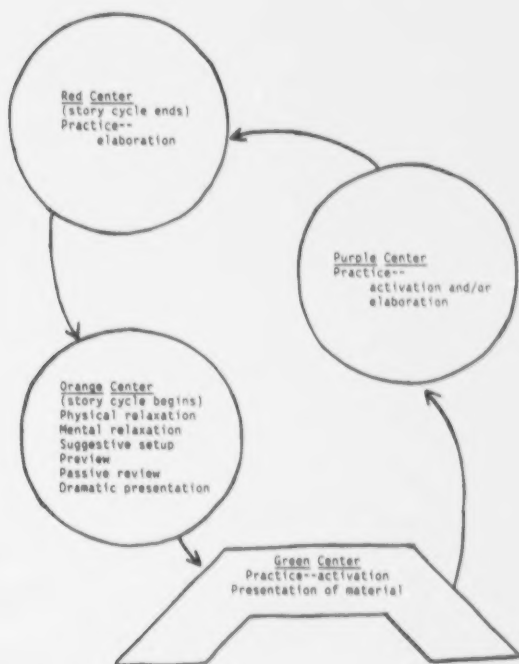
working at the readiness level. Two students entered the class in January. One of the students was reading in the third preprimer at the time of transfer; the other was reading on the readiness level.

The four reading groups did lessons at four color-coded centers in the room. Students worked at two centers each day, thereby completing the four-center cycle in two days. Because only an hour and 15 minutes was allotted for reading, lessons were approximately 25 to 30 minutes in length, with time allowed for changing groups. Students determined the center at which they started working by locating their names on a list posted under a color card on the bulletin board at the front of the room.

When the lesson was completed at the center where the teacher was working, the teacher stood and announced to the class that it was almost time to change groups. She then went from center to center commenting on the work that was done. After all centers had been visited, she asked the students to stand, push their chairs under the tables, and change to the next center. The group at the orange center moved to the green center, the group at green went to purple, the group at purple went to red, and the group at red went to orange. See Figure 1.

Each center fit into the SALT plan. The orange center was for preliminary activities and presentation of material. At the green center, practice in the form of activation occurred when students read the story silently and then orally to the teacher. There was also some presentation of material in phonics and structural analysis by the teacher. The purple

Figure 1 Centers and rotation of groups



center was for practice. Sometimes it was a combination of activation and elaboration. The red center was also for practice. The aide tested students on the new vocabulary. Then an elaboration or enrichment activity was done. Some lessons lent themselves to art projects or dramatization. On other days, the students read with the aide from a supplementary set of books.

The cycle for a story from the reader began at the orange center. Using *Suggestive Accelerative Learning Techniques: Theory and Applications* by Schuster and Gritton (1986) as a guide, the teacher recorded the physical relaxation, mental relaxation, suggestive set-up, preview, passive review, and dramatic presentation. Students listened to the tape while wearing earphones. The orange center was located near the green center where the teacher spent most of her time so it was easy to observe students' behavior. The Appendix contains the script of a lesson for Group 3.

While Group 3 was at the orange center, Group 2 was reading silently and orally and answering comprehension questions with the teacher at the green center. They also decoded words ending with *sh*, *th*, and *ck*. Group 4 was writing words that began with *sl*, *cl*, and *sw*, and illustrating them for a booklet. With the help of an aide, Group 1 was making porcupines out of play dough for a diorama since they had read a story about porcupines the previous day. See Figure 2.

After the groups changed to the next centers, Group 1 did the same preliminary activities as Group 3 at the orange center. Then they listened to a story, "Going Somewhere Special," in the first reader

Reading Activities for a Two-day Cycle

Day 1

Orange Center Group 3

Shoulder stretch
Mountain View
pp. 81-86 "A City
of People"

Group 1
Shoulder stretch
Mountain View
pp. 32-39 "Going
Somewhere Special"

Group 4
Shoulder stretch
Mountain View
pp. 70-75 "Going
Down to the Sea"

Group 2
Same as Group 1
on Day 1

Green Center Group 2

Practice Words
Read pp. 17-20
Answer comprehension
questions
Decode words ending
with sh, th, ck

Group 3
Practice words
Read pp. 32-39
Answer comprehension
questions
Decode long i and
short i words

Group 1
Practice words
Read pp. 32-39
Answer questions
Decode words with sp,
cl, fr, tr, sk, ld, nt

Group 4
Practice words
Read pp. 70-75
Answer questions
Lesson on s, ed, ing

Purple Center Group 4

Make booklet
Put s/words and draw
on one page, cl on
another, sw on
another

Group 2
Write story using
words with sh, th, ck

Group 3
Write long i & short
i words on bows for
long i kite tail
& short i kite tail

Group 1
Do word puzzles for
partner. Example:
bl skate nd. Partner
circles word.

Red Center Group 1

Test new words
Make porcupine out
of play dough

Group 4
Test new words
Make collage circus
mural

Group 2
Same as Group 1
on Day 1

Group 3
Test new words
Paint cityscape

Figure 2. Reading Activities for a Two-day Cycle

and read along with the teacher. Group 3 moved to the green center where words were practiced, the story was read, and questions were answered. Practice in decoding words with the long *i* and short *i* sounds was also given. Group 2 was at the purple center writing a story using words containing *sh*, *th*, and *ck*. The student in Group 4 was at the red center where he read the new words for the aide to check and then made a collage mural of a circus since his story the previous day had been about the circus.

Day 2 began with Group 4 at the orange center. The student listened to the same preliminary activities as the two previous groups and then listened to and read a story, "Going Down to the Sea," from the third preprimer. At the green center, Group 1 practiced new words with the teacher, read silently and orally the story practiced the day before at the orange center, and answered questions about the story. A phonics lesson on initial and final blends was given. Group 3 was at the purple center where they practiced the long and short *i* sounds by writing appropriate words on paper bows to be hung on a tail attached to a long *i* kite and one attached to a short *i* kite. Group 2 was at the red center where they read the new words to the aide and made a play dough porcupine.

After 25 to 30 minutes, the groups changed. Group 2 was at the orange center where they listened to the same tape as Group 1 on Day 1. At the green center, Group 4 practiced the new words, read the story introduced at the orange center, and answered questions about the story. A lesson on the endings *s*, *ed*, and *ing* was presented. At the purple center, Group 1 made word puzzles for a partner to solve. A word containing a blend studied at the green cen-

ter was hidden among extra letters. For example, in the word puzzle, "biskateknd", the partner would find and circle *skate*. Group 3 read the new words to the aide at the red center and painted a cityscape

To provide variety at the orange center, the preliminary activities were changed each time a new cycle began. Sometimes tensing and relaxing exercises were done, and sometimes students were asked to wiggle about to loosen their tight muscles. For the mental relaxation, some guided imagery exercises were written by the teacher and some were taken from books such as Prichard and Taylor (1980). Several suggestive set-ups were written by the teacher, and a different one was used for each cycle. After students became more experienced with the use of imagery and stories became longer, the teacher's reading of the story often replaced the teacher-written guided imagery for mental relaxation. Sometimes students were asked to draw what they imagined before the books were opened and they read with the teacher on the tape recorder.

Since there was only one first grade reading class in the school, it was not possible to have a control group for this study. Pretest to posttest comparisons were not possible either. An administrative decision required that Level B, Form u.c. of the *Comprehensive Tests of Basic Skills* (McGraw-Hill, 1982) be administered as the pretest, and Level C be used as the posttest. The percentiles and grade equivalents on the achievement test administered in May are reported in Table 1.

The word attack subtest yields a percentile only and is not a part of the total reading score. The percentiles and grade equivalents of vocabulary and reading comprehension are combined to give a total

Table 1. Percentiles and Grade Equivalents of Word Attack, Vocabulary, Reading Comprehension, Total Reading, and Language Expression

Group	n	Word Attack	Vocabulary		Read. Comp.		Total Read.		Lang Exp.	
		%ile	%ile	GE	%ile	GE	%ile	GE	%ile	GE
1	5	79.2	82.2	2.6	84.8	3.1	83.8	2.8	88.0	3.0
2	4	73.0	73.5	2.4	73.5	2.4	73.0	2.3	84.0	2.9
3	3	38.0	52.3	1.9	61.0	2.2	57.0	2.0	63.3	2.1
4	1	11.0	18.0	1.2	21.0	1.4	19.0	1.3	26.0	1.3
Class	13	66.8	64.3	2.3	75.1	2.6	73.5	2.3	76.3	2.6
Highest possible		90.0	90.0	3.0	96.0	4.0	95.0	3.5	92.0	3.4

Note: Highest possible score when all items are answered correctly.

reading score. Language expression is also a separate test. Because of the way in which this test was standardized, one error on the word attack subtest resulted in a percentile rank of 76. One error on vocabulary yielded the 80th percentile. One error on reading comprehension was equal to the 88th percentile, and one error on language expression put a student at the 82nd percentile.

One student did not make an error on the entire test. Three students had perfect scores on word attack, 3 on vocabulary, 2 on reading comprehension, and 5 on language expression.

When evaluated in terms of progress in first grade reading materials, Groups 1 and 2 lacked three stories finishing all the first grade books in the Scott Foresman reading series. They completed the primers in the Holt and Ginn reading series. They also completed all the books in the Bowmar Breakthrough set. Group 3 finished section 1 in the first reader in the Scott Foresman series. They completed the primer in the Holt series, the preprimers in the Ginn series, and all of the books in the Bowmar Breakthrough set. All groups read numerous trade books from the school library.

The relaxation techniques were helpful on at least three occasions when individuals were disappointed or upset and had cried. By using the deep breathing exercises, these students were calmed quickly. The deep breathing exercises were also used when students became very excited about an anticipated event, such as the Easter egg hunt. Relaxation and positive suggestions were used before the achievement tests were given.

The positive suggestions became a part of the everyday conversation of the students. The author heard one student tell another that he was reading better and better every day. The author also heard several students comment on how easily they learned the new words.

The guided imagery exercises helped the students develop their listening comprehension and imaginations. They drew pictures that accurately depicted the scenes described in the teacher-written exercises. Their imaginations soared as they drew pictures of the events in the basal reader stories before opening their books, unencumbered by an artist's rendition of the story. Students learned that people differ in what is pictured in the mind's eye, and they learned to appreciate individual differences in their peers.

Reading fluency improved after the taped stories were begun. Word-by-word reading soon disappeared as students read with the model provided on the tape. Students were relaxed as they read orally to the teacher because they had been given the opportunity to practice before being asked to "perform" for the teacher.

Developing positive attitudes toward reading is especially important when students are beginning to read. These first graders seemed to enjoy themselves during reading. There were smiling faces most of the time as students went about their reading activities. Parents reported that the students would sit down and read to them at home. One parent told the teacher that her daughter cried to come to school even though she had a fever.

Research needs to be done using this model for teaching reading. A control group is needed, as well as a greater number of students. An achievement test that will allow perfect scores to measure higher than the 95th percentile is also needed, and the same level of the achievement test needs to be administered as the pretest and posttest. Measures of attitudes toward the method and toward reading are also suggested.

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Appendix

Physical Relaxation

We will begin the lesson with some exercises to help the muscles in your upper arms, upper back, and shoulders relax. Please follow these directions. Slowly bring your arms up and forward as if you were about to hug someone. Let your arms cross and pull your shoulders forward until your shoulders and upper back are rounded. Hold the position for five counts: 1-2-3-4-5. Now, uncross your arms and push your arms back as far as they will go. Hold the position for five counts: 1-2-3-4-5. We'll do the exercise two more times.

Ready? Begin. Bring your arms forward. Hold them there: 1-2-3-4-5. Now push your arms back. Hold the position: 1-2-3-4-5. Forward and hold: 1-2-3-4-5. Back and hold: 1-2-3-4-5.

Now I would like for you to become very quiet and still. Let's do some deep breathing exercises that will help your bodies relax even more. Please close your eyes and take in a deep breath slowly. Now let it all out slowly. Inhale one more time slowly and exhale slowly. Let your body just sink into your chair.

Mental Relaxation

Please continue to breath in a slow, steady rhythm. You may keep your eyes closed. Try to sit as comfortably as you can.

Put yourself in this setting. It is a late summer afternoon, just before sunset. You are at an overlook on a mountain. (Pause 4 seconds.) You can see far into the distance. Peaceful relaxation surrounds you and flows through you. (Pause 4 seconds.)

You look at the valley that extends from the base of the mountain. A farm occupies much of the valley directly in front of you. You see green, grassy fields with white fences separating the fields. (Pause 4 seconds.) In one field, you see a small pond with blue-green water. (Pause 4 seconds.) Some reddish-brown horses are grazing in the cool, green grass nearby. (Pause 4 seconds.)

Farther away, you see layers of hills and mountains. (Pause 4 seconds.) A big red sun seems to sit on the rounded top of a mountain. (Pause 4 seconds.) Now the sun appears to be sinking slowly behind the mountain. It sinks down, down, down. (Pause 4 seconds.) The sun is gone from view now, but the sky is aglow with a bright pink color. (Pause 4 seconds.) Some low clouds take on a purplish color. (Pause 4 seconds.)

You enjoy the brilliant colors of the sky. (Pause 4 seconds.) All tension has eased from your mind and body, and you are completely relaxed.

Suggestive Set-Up

Please keep your eyes closed as you leave the mountain overlook and come back to your reading class. Picture yourself sitting at the table with your reading book in front of you. See yourself reading. You are very calm and relaxed. The words come into your mind very easily. You are reading better and better every day. You feel a smile on your face because it is fun to read.

Preview

Please continue to sit in a comfortable position as you imagine the things in the story. Today's story is about a city. You will find out many things about cities and the people who live and work in them.

Passive Review

The teacher dramatically reads the story, "A City of People," while the students listen with their books closed.

Dramatic Presentation

Now please open your eyes and turn in your books to page 81. Before we read, please look at the picture. You see many tall buildings, cars along the street, and a big yellow sun coming up. Did the city in your imagination look like the one imagined by this artist?

Now read along with me. (Teacher reads page 81.)

Please go to page 82. Look at all the people. Notice the different kinds of transportation or ways to travel. Let's read page 82 together. (Teacher reads page 82.)

Now look at page 83. See the policewoman directing traffic. Please read with me. (Teacher reads page 83.)

Now on page 84. You see people buying food. Now let's find out what the words say. (Teacher reads page 84.)

Please go to page 85. Here are people walking their dogs in the park. One dog is running and pulling his owner. Please read with me. (Teacher reads page 85.)

Now on page 86. it is nighttime in the city, but people are doing many different things. Now let's read this page together. (Teacher reads page 86.)

I know you have been good listeners and good readers. If you have extra time, you may practice reading the story with a partner. That is the end of the lesson. Please stop the tape recorder.

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**Unlearning Technologies:
Coping with Anti-suggestive Barriers
in Industry Training**

Otto Altorfer
Japan Air Lines

Abstract. This paper explores options how to apply processes of de-suggestion to previously acquired skills, attitudes, or habits which, at a later stage in development, prove restrictive or limiting. It addresses especially deeply rooted "hardcore" restrictions that cause high levels of resistance.

First, characteristics of such hardcore restrictions are investigated and connected to the dynamics of unhealthy symbiosis and to the factors restrictive to the "natural" or accelerated pace of learning as presented by Lozanov.

Secondly, the implications of removing such barriers on the second or emotional level are explored especially for the professional teachers whose responsibility it is to create a credible climate for accelerated learning.

Thirdly, the paper presents a theoretical framework for unlearning or "de-suggestion" and presents three approaches of practical applications.

* * *

Introduction

McDonald's focus on "no previous experience necessary" is not only designed to attract low-cost labor, but, equally important, people without previously acquired "undesirable" habits. The company thus by and large hires people comparable to a blank sheet of paper. In times of rapid change, existing learnings are often a hindrance. Often, it takes teachers and managers more effort to have their people undo existing skills and habits than to develop new ones.

Lozanov proposed (1978) that every suggestion, every new learning, has also an anti-suggestive effect, meaning that the new learnings automatically eradicate old beliefs, attitudes or habits around the respective subject matters. This may be true in the acquisition of a new language with no previously learned messages. It is different however in Industry Training where we often deal with rapidly occurring changes.

Lozanov describes three approaches to counteract restrictive factors to learning and functioning:

1. The creation of a positive structure of the learning atmosphere: attractive learning setting, a state of relaxation, enhancing of psychohygienic conditions, acknowledgment of authoritative sources (Caskey, 1980) the skill of rapport building, crucial first impressions (Dhority, 1984) etc.

2. Techniques of by-passing the learning barriers through psychological and artistic means, such as organized methodology, a relaxed state of mind, bilateral hemisphere input, simultaneous use of the conscious and unconscious mind, emphasizing multi-sensory, psychological and artistic elements, (Caskey, 1980) etc.

3. Procedures of de-suggestion or unlearning. There are very few practical steps in classic Suggestology literature aiming at the elimination of restrictive-limiting programs, except Lozanov's concept of self-image change. You can fly, but that cocoon has to go" (Ostrander & Schroeder, 1979).

Some of those cocoons are extremely hard to get by. Often, they don't disappear simply by applying positive structure, or applying by-passing techniques. This is especially true when we deal with hard-core, restrictive-limiting programs. We define hard-core restrictions as deeply ingrained programs, often directly opposed to a desired thought or behavior.

We have noticed that "hard-core" restrictions often stem from unresolved and therefore unhealthy symbiotic dependencies. Interestingly, these restrictions are not only found in students, but also in teachers who may be knowledgeable and aware of restrictions intellectually, yet not free of them emotionally.

This paper first looks at characteristics typical of unhealthy symbiotic dependencies which are then compared with factors recognized in suggestology as restrictive to the "natural" pace of learning, and causing the "downshifting" of the brain. (Hart, 1983). Secondly it discusses some technologies which have proved especially helpful to cope with heavy anti-suggestive barriers in industry education.

1. Symbiotic Dependencies and Anti-suggestive Barriers

A symbiosis is a relationship between two (or more) organisms that is advantageous for both. In human development we differentiate between healthy and

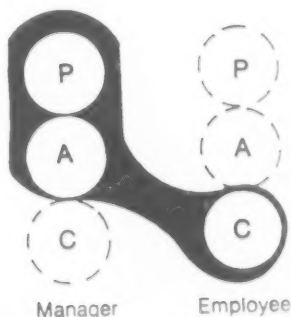
unhealthy symbiosis. A healthy symbiosis is a natural state of dependency, first physically, later psychologically, for the purpose of survival and growth of an infant. Adulthood is characterized as self-supportive, self-regulated, or autonomous.

Characteristics of Unhealthy

Symbiosis If a symbiotic condition continues beyond the state of natural need, we deal with an unresolved and unhealthy symbiosis in which two people behave and function as one. Different functions of life are divided up into roles according to personal preferences, beliefs, or social mores. This sets boundaries or limitations to a person's self-development and self-expression, and consequently to a person's feelings of fulfillment and self-esteem. It also creates external control dynamics of domination and submission, and parameters of inferiority and superiority according to prevailing value systems. An effect of this is a system of inequality.

In Transactional Analysis, a symbiotic relationship becomes more easily visible through the paradigms of the three energy sources called PARENT, ADULT, CHILD.

Manager-Employee
Symbiosis



"I do the thinking,
you do the doing."

This paradigm displays an example of symbiotic dependency in an organizational setting (Altorfer, 1977): The manager who functions predominantly in PARENT and ADULT modes will in certain situations permit his employees to only use their CHILD energies, according to the formula "I do the thinking, you do the doing."

Such role distribution can also be observed in family settings: A wife may not allow a husband to cook a meal, or, if he does, may anxiously stand by and look over his shoulder. By the same token, a husband may ridicule his wife when she repairs the car, or does some carpentry. This first results in blocked self-expression of existing talents. The related deprivation of satisfaction is oftentimes experienced as frustration. Precious energies ready and willing for action are condemned to inaction. The question then arises: what happens with energies not used? Since energies cannot dissolve but only transform, we can look at a pot of milk standing around unused for days. Eventually it gets sour. It spoils.

Spoiled energy is often observed in people as anger, or sadness, or other forms of joylessness, or as outright spite or rebellion, or as negative attitude. In these situations people easily become victims of negative suspicions; it becomes increasingly difficult for them to see the good, or to have compassion, or to be forgiving, or to give praise and recognition in credible ways. They may at times even experience despair and give up efforts to search for the blessings behind difficulties and problems.

These are the times when people are extremely restricted in their ability to express satisfaction, when the expression of the joy they still can muster is limited to sarcasm or other forms of biting humor, or when they succumb to compulsions to exert negative control

over others, playing games, insisting on being right, making people 'wrong', or making compelling demands on them, having at least the satisfaction of seeing others suffering a little.

Often, the truth of such life-defeating behavior is self-hate or self-alienation. It is the result of ignorance and lowered self-esteem caused by the fragmented use of their energies. Here is where the symbiosis-autonomy concept connects to Lozanov's quest for self-image change.

It is suggested that unresolved symbiotic dependencies are major factors causing not only limitations in growth and relationships but also slow-downs in learning and functioning. The parallels in the limiting symptoms as well as in their remedies are astounding when we compare the studies of unhealthy symbiosis and autonomy concepts with the findings presented by Lozanov and SALT experts shown in the following two tables.

Table 1 compares negative factors restrictive to growth and self-development as well as to learning and functioning, and

Table 2 compares positive factors conducive to autonomy and self-regulation on one side, and 'natural', accelerated learning and functioning on the other.

Symbiosis or autonomy are seldom found in pure forms. It is therefore more practical and beneficial to think in terms of a continuum in this respect. The ten stages of the 'Environmental Quality States' developed by Jack Gibb (1978) are helpful in identifying stations on this pathway. See Table 3.

Table 1. Negative Factors

A. Based on symbiosis-autonomy concepts (Berne, 1964; Harris, 1967; Schiff, 1975; Philipps, 1975; Child-Cowell, 1979; Fromm, 1956):

- blocked self-expression
- external control by roles/structures
- no options or choices
- inequality: one-up, one-down relationships
- fragmented use of human energies
- frustration and resentment

B. Based on accelerated learning concepts (Lozanov, 1978; Caskey, 1980; Dhority, 1984; Schuster-Gritton, 1986):

- overt and covert didactogeny;
 - senseless teacher discipline and control
 - imposed restricted beliefs
 - fearful/negative parent expectations etc.
 - oppressive "authoritarian" authority
 - discrimination in the use of one half of brain
- (for more detailed references see Appendix A)

The first three stages may be considered as relative states of symbiosis, the other seven as relative states of autonomy. Experiments applying the Environmental Quality Scale to the relationship of organizations and their members showed oftentimes that a gap of more than three states represents an acute conflict with difficulties in communication and behavior. It became obvious that it would be a leader's responsibility to have awareness, flexibility and positive intent in order to make adjustments for harmonious guidance. This we observed worked only as long as the leader was closer to a state of autonomy than the subordinate. We also

Table 2. POSITIVE FACTORS

(References as in Table 1.)

A: Based on symbiosis-autonomy concepts

- internal control and self-discipline
- permission to use/express whole person
- equality and high esteem of self and others: I'm OK - you are OK
- awareness, spontaneity, intimacy in the pursuit of autonomy (Berne 1964)
- having options and choices

B: Based on accelerated learning concepts

- joyful freedom to learn and function
- whole brain functioning - unity of conscious and paraconscious mind
- authority through sympathy and nurturing
- confidence in own ability - good self-image
- the use of positive suggestion
- concentrative psychorelaxation

(For detailed references see Attachment A)

Table 3: Environmental Quality States

PUNITIVE	- creating security to survive chaos
AUTOCRATIC	- to create order, power and structure
BENEVOLENT	- to protect and help
ADVISORY	- to be objective, rational, scientific
PARTICIPATIVE	- to belong and be recognized as equal
EMERGENT	- to respect and to be respected
ORGANIC	- to trust the expression of feeling
HOLISTIC	- to be fully whole, united, integrated
METASENSORY	- to be inner-directed by spiritual self
COSMIC	- to be part of and one with the Universe

observed that many organizational difficulties stemmed from the fact that leaders were often closer to symbiosis than their subordinates.

It is suggested that this may also be true in teacher-student relationships. It is not by accident that Lozanov (1978 and 1981) refers more than once to the need of authentic teacher training.

Recognizing that symbiotic dependencies must not only be intellectually understood but also emotionally experienced suggests that a suggestopedic teacher must also work through his/her anti-suggestive barriers similarly to what a psychoanalyst goes through in his/her own analysis in order to insure full integrity. Division between intellect and feelings, or between conscious and subconscious mind, creates credibility gaps. A point presented with intellectual elegance but lacking emotional support will miss its mark and cause a credibility gap. Talking about equality for instance is idle when I'm still in the habit of looking down on people. Here are some conclusions within this area.

1. that a leader or a teacher can credibly create favorable factors toward accelerated or "natural" learning and functioning only to the degree he or she has integrated them, on conscious and subconscious levels.

2. that the teacher takes responsibility for him/herself to resolve hard-core barriers and unresolved symbiotic dependencies.

3. that teachers learn to resolve hard-core barriers and symbiotic dependencies within themselves. The following unlearning technologies will assist them in this endeavor.

II. Unlearning Technologies

A Theoretical Framework

According to Penfield (1975), everything that ever entered the human mind through senses or intellect stays recorded. All that is recorded however is not necessarily active, e.g., influencing our daily thoughts, decisions and reactions.

Active programs are known as beliefs, attitudes and habits. They shape our daily thoughts, feelings and conditions; they also are the marks of what we know as our personality. In a way they are automatically present and available. They determine the quality of our automated functioning as well as the quality of our daily consciousness.

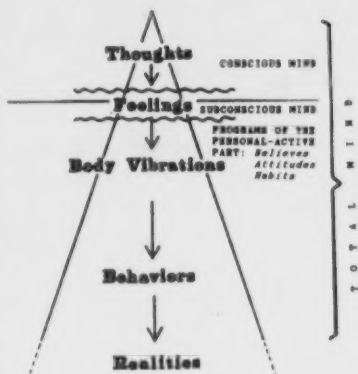
A thought may have little power until it has been promoted to a belief, a feeling may be a fleeting occurrence until it has become ingrained as a lasting attitude, even behavior may be casual and non-repetitive until it has become a habit.

Beliefs, attitudes, and habits are the functional automations which are stored in our personal subconscious mind and which present themselves either on a related occasion or simply at regular intervals. When we have a conscious thought counter to those functional automations, it is unlikely that it will materialize no matter how logically desirable and beneficial it may appear to our life. New Year's resolutions generally illustrate this situation quite well, or the great story of the frog and the scorpion.

Yet, it is in the power of the conscious mind to make things happen through choices and the exertion of control. It is at the thought level that directions are taken and decisions are made. It is at the level of the intellect where a person will prove a master or a servant of beliefs, attitudes and habits. What determines success or failure in this endeavor? When we compare

the human mind with an iceberg the very small visible part is analogous to the conscious mind or the intellect, while the large submerged part is representative of the vast area of the subconscious or paraconscious mind.

Within that vast territory, we are here only concerned with the personal subconscious mind, and within the personal subconscious only with the personal programming. Our personal programming is subdivided according to subject areas, such as eating, money, work etc. These subject areas can be compared with apartments in a big complex, and the programs as their tenants.



Now let's say a "program" about work is perceived as work being a drudgery, as an inevitable evil, or a struggle. When the conscious mind now comes along confirming this thought that work is an inevitable evil, a drudgery or a struggle, there is peace and harmony because conscious and subconscious mind are together in this.

However, when the conscious mind one day claims that work is a pleasure we are in conflict. The subconscious mind will immediately respond negatively to the conscious suggestion; and it will produce all stored evidence that it is right. It is a situation of conflict. Many people even feel that the subconscious mind is a person fighting with them. However that is not so. The subconscious mind is neither an animal nor a human being. It is simply a very reliable mechanism which stores our past experiences and decisions and makes

sure we are reasonably well sticking to them to assure survival and consistency of character.

There are two ways to resolve this conflict situation: Either we decide to adjust the conscious thought, or we decide to change the subconscious program.

The first solution is easy and requires no big effort; also it is as fast as our thought gives in to the old decision or program. Nothing new happens; status quo prevails, and with it the feelings of drudgery and quiet pain about work.

The second suggestion to change the subconsciously stored program requires effort, knowledge and skills. It is like giving notice to a long-term tenant: It takes some time and effort. The desired thought that "work is a pleasure" cannot succeed and come to fruition until the old program "work is a drudgery and a struggle" is eliminated. This is a reason why straight affirmations or positive structures have only shallow or no effects. This is especially true when we deal with deeply ingrained programs stemming from unresolved symbiotic dependencies, and programs which are completely opposite of the new and desired thought. As in an apartment situation: Before the new tenant can move in, the old one must have moved out.

There are often situations where existing programs must be eliminated in order to experience progress. In the following we present methods which aim at weakening and eventual elimination of existing beliefs, attitudes or habits.

Unlearning methods

If the mind would operate like a calculator or a computer, unlearning would simply consist of pushing the

erase or remove key. Cancelling mental materials by simply instructing the mind with "Not true" or "Forget it" works on the initial thought level; it isn't that simple on the levels of beliefs, attitudes and habits.

Experience shows time and again that denying a belief has little effects; often, denying a belief has a contrary effect, causing reinforcement of the belief we intend to remove. This is generally referred to as "negative reinforcement." New Year's resolutions often have this effect. It may be true that denial is an essential first step in mind work in order to disengage, or to set oneself apart from an unwanted belief. The problem is that defensive energies in connection with such denial will result in reinforcement rather than removal.

To avoid this potential energy conflict after an initial denial of an existing belief is to fully concentrate on the desired state. This can be done by taking the desired belief into an open space, a temporary "empty apartment," where it is undisturbed by the old belief and unaffected by doubt and other limitations.

Open Space Approaches

Concepts of open space are not new; they have been revalidated by people such as Brunton (1935/85), or by the practices of the Quakers, or by books, such as "Living your Dying" (Keleman, 1975), or "The Void" (A.H. Almaas) etc. Open space concepts have been reinstated as valid processes by people such as Jack Schwarz (1975), Harrison Owen (1987), etc.

Owen considers open space as an integral part in individual and organizational transformation. Transformation in organizations is seen as a departure from traditional practice of using organizations as tools of pro-

ductivity and prosperity, instead of as self-regulating and creative living organisms. Owen's model consists of four stages of:

open space	generation	structure	dissolution
(absence of	(or build-up	or form	(of structure)
structure)	of structure)		

He contends that every organization starts in the stage of open space that is open to the creativity of pure consciousness, or the spirit, which eventually causes the generation of a structure with a purpose, set policies, clearly defined processes and goals. The more "regulated" a structure is, (the greater the "dogma,") the less space is free for consciousness or spirit, as well as for experimentation. This in turn leads to rigidity, and consequent inflexibility to cope with the changes in the environment, and eventually to the dissolution or death of the structure.

In a real sense, open space is identical with death. "Death is the secret of life. We must empty ourselves if we want to be filled" (Brunton, 1935/85). The "benefit" of death is seen in the removal of any restrictive dogma, structure etc., thus establishing freedom for the spirit to create anew. Transformational practices derived from this new organizational theory now attempt to create open spaces on purpose in order to facilitate a synthesis or fusion between creative consciousness and the organizational structure, thus creating, as Lozanov (1978) expresses it, "a suggestive link on the level of the reserve complex."

Open spaces are offered in various forms: from general open space in the human mind, as found in the "Empty movie screen" meditation (Schwarz, 1975)

to partial open spaces, as found in buzz group techniques with suspended judgment, to the "cheap learning" approach of experimentation of excellent companies (Peters and Waterman Jr., 1982).

1. Buzz groups with suspended judgment

In buzz groups, three to five people are put in a close discussion circle with a topic, for example "Why do people make mistakes?" The open space is created by the leader's responsibility to facilitate consensus through preventing communication's becoming judgmental, critical, argumentative, agreement seeking, etc. In other words the data produced by any of the group participants cannot be questioned, judged, discussed, tossed around, belittled, enhanced, etc. When participants feel the effect of this, they produce more data at an accelerated rate, as if the non-judgmental vacuum attracted them.

2. Experimentation

To allow open space for experimentation, modern organizations like 3M, GE or IBM design their budget "a little leaky." Peters and Waterman Jr. (1982) conclude that "the experiment is the most powerful tool for getting innovation into action." The "relative invisibility" protects the new creation from being suppressed by traditional forms or successes. Again, we observe the creation of open spaces which allow untested steps, novel approaches, non-traditional procedures (apart from the standard operating procedures) even at the risk of failure, thus inviting the free spirit of creation.

3. Context expansion

An approach we want to call "Context Expansion" was chosen in order to prevent certain forms of resistance in relaxation practices. A "Mindcalming" tape

(Altorfer, 1985) presented five different methods of relaxation. Participants are invited to first test each method to find out which type of relaxation was most effective for them. Here, open space can be experienced as the message that not everything labeled as "relaxing" must necessarily be relaxing; in other words participants experienced permission to choose.

The many practices of open space are not new, especially in the fields of learning and teaching, but they are being rediscovered and revalidated within the context of mind and spirit "mechanics." Open spaces free a person, sometimes only temporarily, from the restrictive and limiting effects of existing structures.

Now, also based on observations and experiences of learning and teaching, especially in industry situations, there is oftentimes a need to make those open spaces more permanent. Oftentimes, people get filled with enthusiasm and good intentions during training, but then experience themselves retracting to old patterns after a few weeks. This indicates that the old tenants (old beliefs, attitudes, or habits) have not yet permanently vacated their premises.

To create open spaces on a more permanent basis, we must select a more direct approach, to take the bull by the horns, so to speak, undoing or unlearning existing structures of the mind, e.g., beliefs, attitudes, habits.

Aiming at Undoing Programs

This is a modification structure which directly aims at eliminating an existing program that is undesirable.

The program structure is a affirmation-response procedure consisting of the following steps:

1. creating awareness of the limiting belief
2. formulating a clear affirmative statement of the desired belief
3. repetitive writing of the affirmative message
4. careful monitoring of accepting and rejecting thoughts which surface to the conscious mind in response to the affirmation.
5. an inner posture of non-judgmental observation, patience, and tolerance.

A mental posture of persistent denial, or rejection, or rebellion or even fight, is to be avoided. We are here not dealing with a reluctant force, but with a creative power that is totally subjective and cooperative. That is why the subconscious is also identified as the "Subjective." "The Subjective is a world of Law and of mechanical order...it is never a person though it often appears to act as though it were one." (Holmes, 1938). The fact that the subconscious mind appears to fight like a person is its nature, a blessed quality of its task, e.g. to hold on to a belief. The purpose of this resistance is a built-in "fail-safe" calling to our full attention whether we really want such change.

Defensiveness or despair therefore is not called for at all; what is needed is calm observation and firmness that we want to go through with the change. Four days of affirmation and response procedures are generally sufficient to impress the subconscious mind with the new direction, and to allow the old "tenant" to peacefully move out, to fade away. The affirmation-response procedure is displayed in appendix B, a practical example is presented in appendix C.

When the affirmation-response procedure is stopped after four days, the subconscious is still going on with the process. We will know when the new program is installed as new belief, or attitude, or habit when it surfaces into the conscious mind by itself, when we can accept the new thought also emotionally, e.g. feeling comfortable with it, and when we start to automatically respond with the new belief, attitude or habit in a respective situation. This is generally a highly exhilarating experience which fills a person with deep satisfaction and fulfillment. It is living testimony of man's true power and freedom.

Summary

This paper has attempted to demonstrate that the process of de-suggestion, or unlearning, is not a matter of course in connection with processes of affirmations or suggestions, especially when we deal with automated materials that are in active use for a long time, e.g. hardcore beliefs, attitudes, or habits. Once automation is established in the long-term, active memory, the need for a conscious effort of de-suggestion becomes apparent.

It also has become apparent that there are not many established technologies for unlearning developed and available, especially in business and industry. This may explain why this challenge may be often avoided, as with hiring practices, or early retirement trends, etc. Such practices are of course not a solution; they fall in similar categories like the forced adaptation or suppression of attitudes and habits. So far, the average successful man and corporation get by with superficial adaptation with paying however an increasing toll in forms of damaging stress effects.

There is no doubt that the accelerated rate of change of the rapidly moving information era will eventually suggest the need for increased flexibility also on the deeper, e.g. automated levels of human functioning in order to maintain health and sanity for the individual, and prosperity for corporations.

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APPENDIX A

Detailed references to negative factors

- overt and covert didactogeny (Lozanov, p.252) -
 - when students are harassed and oppressed by the teacher, when "teaching methods have so far been in accordance with accepted 'restricted' capacities of the human personality" referring to
 - o limited level of human memory
 - o restrictive beliefs in human capacity
 - o fear of parents for future of children
 - o teachers' requirements (discipline), senseless degrading repetitions, unnecessary analysis
- anxiety and feeling of threat, (Caskey p. 33)
- tension which is tiring and energy consuming to a high degree, (Lozanov, p. 258)

- notion that educational systems and society in general discriminate against one whole half of the brain, also favoring materialistic and behavioristic thinking, (Caskey p. 26-27)
- imperative rules or commands like "Shut up!", "Stop!" "Don't do that!" etc., (Schuster & Gritton p. 26)
- threatening, oppressive "authoritarian" authority (Lozanov p. 187, Schuster & Gritton p. 27)
- unattractive, uncomfortable learning setting: poor acoustics, poor decor, external noises, uncomfortable

Detailed references of positive factors:

- joyful freedom to learn and function (Lozanov, p. 258)
- concentrative psychorelaxation (Lozanov, p.259)
- to create and have confidence in own ability, (Lozanov, p.259)
- unity of conscious and paraconscious, (Lozanov, p.259) (allowing all parts to participate, not discriminating)
- the suggestive link on the level of the reserve complex - accessing the "untouched" level (Lozanov, p. 260)
- authority through sympathy and nurturing, (Lozanov, p. 59; Schuster & Gritton p. 27) "The concept of authority (not authoritarianism!) as it is used in suggestology stands for the non-directive prestige which by indirect ways creates an atmosphere of confidence and intuitive desire to follow the set example." (Lozanov, p. 187)
- the positive use of "suggestion" vs negative use (Schuster & Gritton, p. 54)
- infantilization, the childlike state of joy..

APPENDIX B

Affirmation

Response

Negative thought:

(List your thoughts while writing affirmation:)

I. Developing the affirmation:

1. Reverse negative thought above
2. Formulate a positive message
 - appealing to your mind
 - in verbally simple form
 - as positive as possible
 - in the present tense
3. Personalize affirmation
Example:
Work is a pleasure (impersonal)
I, John, am highly pleased with
my work (personalized)

II. Affirmation procedure:

1. Repeat affirmation 12 - 15 times
for four days: writing, thinking
vocalizing it etc.
2. Repeat it by alternating from
"I" to "You" to third person
(name)

Examples:
I doubt it.
3. Visualize practical benefits of
the affirmation.

- | | |
|---|--|
| <p>4. Monitor any thoughts and feelings
 which surface into conscious-
 while doing the
 affirmation.</p> <p>5. Don't judge or condemn
 resisting thoughts/feelings;
 just observe and record them
 in the response.</p> <p>6. Keep repeating the affirmation -
 stay conscious - keep breathing.</p> | <p>Yes, but..
 But my mother
 said..
 It would be ness
 nice..
 It's nonsense..
 I'm born that
 way!
 I believe it.
 I can't help.
 That's not me..
 etc .</p> |
|---|--|

APPENDIX C

AFFIRMATION: in response to: "feeling powerless toward authority"	RESPONSE:
1. I, Elaine, feel greatly honored receiving orders/advice.	I hate being told what to do
2. You, Elaine, feel greatly honored receiving orders/advice.	I need guidance
3. Elaine feels greatly honored receiving orders/advice.	How can anybody be "honored"
4. I, Elaine, feel greatly honored receiving orders/advice.	^{receiving orders} Even my mother hated it!
5. Yes, Elaine feel greatly honored receiving orders/advice.	I'm really angry about this ^{now}
6. Elaine feels greatly honored receiving orders/advice.	Of course it would be nice feelin "good" about following orders.
7. I, Elaine, feel greatly honored receiving orders/advice.	
8. You, Elaine, feel greatly honored receiving orders/advice.	
9. Elaine feels greatly honored receiving orders/advice.	
10. I, Elaine, feel greatly honored receiving orders/advice.	
11. You, Elaine feel greatly honored receiving orders/advice.	
12. Elaine feels greatly honored receiving orders/advice.	

APPENDIX D

EXAMPLES OF INDUSTRY SEMINARS INVOLVING UNLEARNING TECHNOLOGIES

Service Skills and Attitudes - 4 days

This is a comprehensive advanced seminar designed to assist experienced professionals in coping with the accelerated technical changes, customer motivation, and competition.

Overall goal: Attitudinal flexibility. At the end of this course, participants will be familiar with the nature of their automated functioning, e.g. attitudes and habits, and with skills and techniques enabling them to develop appropriate, and to discard or modify undesirable or obsolete attitudes.

Attitudinal flexibility enables service professionals to respond to changes in more comfortable and authentic ways as opposed to superficially enforced ways, allowing them to function at a high level of integrity, and to professionalism and credibility also under adverse condition.

Course contents:

- Getting in touch with attitudes and habits
- Wholebrain functioning: Accessing the "reserve energies" of the mind
- Nonverbal communication
- Managing internal energy, emotions and stress
- Functions of the human mind
- Self-motivation and self-observation
- Techniques for developing new, and for discarding or modifying undesirable or obsolete attitudes

Work Relationship - 3 days

Overall goal: This seminar will present and reinforce positive options, awareness, and skills around relationships with customers, co-workers, superiors, subordinates, work itself, the company, oneself etc. to participants.

Course Contents:

- Recognizing relationship qualities for success and failure
- Wellness and stress in relationships
- Theory and practice of Superlearning or Suggestology
- Intellectual and emotional factors of functioning
- Accessing and mobilizing "reserve energy"
- "Skill Factors" and "Mind Factors"
- Elements of "Mind Factor" training
- Mind management: Structures and functions
- Self-motivation and self-observation
- Developing and modifying beliefs, attitudes, habits
- Multi-sensory goal setting
- Practical application according to participants

Stress and Wellness Management - 2 days

Overall goal: Participants become acquainted with physical and mental aspects of wellness around work. They learn the basics of stress and four approaches, practically and theoretically, to release or prevent stress.

Course Contents:

- Wellness: Meanings of work besides "making a living"
- Maintaining everyday wellness
- Work and Career satisfaction
- The nature of stress: Symptoms and causes

- How stress of the mind influences the body and a person's health
- Different ways of managing stress: physical relaxation emotional release, behavior modification, monitoring and managing the quality of thoughts
- Self-observation
- Practical application according to participants

BOOK REVIEW

The Joy of Writing by Robert S. Wilkinson True Artist Pub., Inc., P O Box 3029, Palm Beach FL 33480, 116 pp. 1987 edition. Reviewed by John Senatore.

Why did the editor ask me to review this book? Is Wilkinson a first to implement SALT methods to the teaching of writing? Literacy is the larger issue for efficient, effective instructional methods.

People become literate when they associate necessity and pleasure with acts of literacy. My schooling included associating fear, pain and anger with reading and writing; for example, write three hundred words on...because you were "bad." Wilkinson has an organized system that worked for him. "If you missed *The Joy of Writing* in school, try it now; it still works." Learners left his courses *liking* writing and literature.

Having the abilities and intelligence to write, why do children write so poorly? Wilkinson discovered that writing is not taught, no one taught him how to teach writing and writing is more talked about than practiced. "We have no system. We do not *let* children write," he emphasizes. So, "let people write" frames his system used in Grades 8-12 and in Adult Education (Re-training, or restraining of self, may be a first task for effective literacy teachers.)

A primary distinction for this book: Its length. The book contains assignments, directions, shared experiences, and examples of students' writing--not orders, not paralyzing prescriptions. Wilkinson presents a

series (17) of writing assignments, sixteen that prepare writers for expository compositions, since "Children are not ready before Grade 11 for expository writing."

The program is not to be rushed through. The time-commitment by the teacher and the curriculum, and the abilities of learners, determine the length of time for successful completion.

The series of assignments aims to do four things: Give direction to writing; make papers more enjoyable for teachers and students; make students aware of their brainpower; and produce true writers. Writing improves reading and work is fun, Wilkinson and his learners discovered. He uses Creative Testing, testing that continues learning.

This is a discursive program. No communication is complete until it is checked out and, unlike some courses, the teacher is not the primary or only reader addressed. Learners who may decline to read their compositions, learn to give and receive appropriate, effective feedback--a whole trust-environment format that replaces a range of failing conventional classroom behaviors.

Under an assignment "Imagination Organizes," Wilkinson acknowledges as one of his sources Buzan's Mind-Mapping, an effective tool resembling Rico's Clustering in whole-brain writing. The author subtly integrates desirable curricular elements; for example, students learn Person while writing Perspectives; they also learn about the cycle of communication writing directions to reproduce a drawing; they learn how to differentiate and use logical support and emotional support without first learning syllogisms and faulty logic (a traditional approach) to compose persuasive and argumentative papers.

The Progress Book, used by students, accompanies The Joy of Writing, and offers these advantages: No papers to hand out; fewer lost papers; a record of work and progress; physical evidence of accomplishment; work organized for review; a ready reference of repetitious problems and corrections; elimination of discussion of grades; answers to parents' questions; and a student reference for review and suggested further development.

If you share Wilkinson's outcomes, order this fine, beginning, doing-book. In his Forward, Eugene H. Pool testified that he has successfully used this book and this approach during and over twenty years of teaching the gifted and not-so-gifted. "It is the best way I have yet found to communicate to a diverse group that good writing is not only accurate communication but also a personally uplifting experience." Add Wilkinson's 25 years' feedback experiences and, in this small book, you have materials that work and deserve careful consideration.

Beginning with Wilkinson, SALT practitioners may even better, may enrich, may develop further what he presents with relaxation, music, more suggestions. Committed to literacy, what will you contribute to the day we will hear, "There's no place in this school you can go where they don't make you read and write! Isn't it fun!"

Apology

We owe our readers an apology for our not having the usual foreign language abstracts at the end of each article. An unusual problem came up while preparing this issue: all 3 of our foreign language translators had problems at the same time. This had not happened before in the short history of this journal.

If you would like to volunteer your expertise to translate journal article abstracts from English into French, German or Spanish, please write me.

The Editor

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Guidelines for contributors to the JOURNAL OF THE SOCIETY FOR ACCELERATIVE LEARNING AND TEACHING

The Editor welcomes submission of manuscripts with a focus on accelerating and improving teaching and learning, particularly with classroom suggestion or Suggestopedia. This journal publishes articles on: critical reviews, theoretical analyses, speculative papers, case studies, quasi-experimental studies, as well as reports of controlled studies of empirical research.

MANUSCRIPTS should be typed on one side of standard 8 1/2 x 11 bond paper. Do NOT use ditto. The original and 3 copies of all materials should be submitted, but the author should keep a copy for checking proofs. All material should be DOUBLE-SPACED, with ample margins on all 4 sides. Typical length is about 20 pages, including footnotes, tables & figures. Longer papers may be suitable in some cases.

REFERENCES should follow APA style according to the latest American Psychological Association Style Manual. See any issue of this Journal for examples. In the body of the text, the work of other authors should be referred to by name and publication date in parentheses as follows, "Xia and Alexander (1987) reported..." In the references the referred-to articles should be listed fully in alphabetical order by author(s), title and publication source information as follows, "Voci-Reed, E. (1987). Teaching adult learners using accelerated learning. Journal of the Society for Accelerative Learning and Teaching, 12 (1&2), 85-94." Footnotes should be used rarely, if at all.

TABLES and FIGURES should be kept to a minimum, and should supplement rather than duplicate the text material. Each table should be typed on a separate sheet of paper and placed at the end of the manuscript. Figures should be submitted in a form suitable for photographic reproduction: use India ink on a good grade of drawing paper. Photographs (black and white only) should be 5x7 glossy prints.

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**Suggestopedia: A Suggestive-Accelerative Teaching
Technique in Teaching English as a
Second Language to Adult Learners**

Bertha Du Babcock, Ed.D.
University of San Francisco

Abstract. The history of language instruction includes a great diversity of methodologies. As far as the effectiveness of teaching techniques is concerned, there has been little agreement as to which disciplines are the the essential ones. The literature on second-language development identifies two processes by which each individual might develop basic communicative competency in second language learning and acquisition. It is proposed that any approach that deals with language and that focuses on both acquisition and learning will be fruitful. Suggestopedia is an approach that facilitates second-language acquisition naturally with emphasis on communicative competence and realistic utterances.

This study investigated and evaluated the effectiveness of the Suggestopedic approach in teaching English as a second-language to adult learners. Subjects were from the Refugee Women's Program and the San Francisco Community College Centers. The results indicated that students instructed in Suggestopedia showed statistically significant gains on both a grammar (STEL) and Vocabulary Inventory Test (VIT). The findings suggest that Suggestopedia is an effective method for teaching English as a second language to middle-aged refugees with linguistically diverse backgrounds.

Background of the Study

For the last decade, Southeast Asians and East Africans have made up a large portion of the refugees to the United States. There has been a great need for this group to be rapidly integrated into the social and economic structure of this country. The challenge is not only to develop a successful program based on effective instructional approaches in teaching English as a second language (ESL) to these adult immigrants but also to help them attain adequate and successful psychological, cultural, and social adjustment.

VESL (Vocational English As A Second Language) Program

According to a survey in 1983 by the Office of Refugee Resettlement (ORR), the refugee unemployment rate in California was double that of the national average. As a result, both state and county governments have increasingly required refugees to participate in job-training and subsequently to seek employment. Thus, the overall goal of the Refugee Women's Program--Housekeeping Training Project was to train and permanently place these refugees in the field of housekeeping as a means to help them become employable and self-sufficient. Trainees entered the training program at the ESL 100 or 200 levels. Upon completion, trainees were expected to be competent in job-related English, cleaning-service skills, and health and safety procedures.

The curriculum consisted of eight weeks of English instruction in a) job-related language skills, b) household English, c) health and safety procedures, (d) problem-solving techniques, and (e) cultural awareness skills.

The primary objectives of job-related English were: to introduce the students to household vocabulary, household products, and hotel housekeeping vocabulary and procedures. In household service skills, the emphases were on the introduction of operating and cleaning procedures for household appliances. The curriculum also introduced health and safety procedures for using household products and various cleaning appliances as well as first-aid procedures. To prevent possible misinterpretation and to encourage different ways of perceiving problems, the materials also tapped problem-solving skills. In addition, cultural awareness skills were introduced. The instructional kits introduced each participant to the basic cultural theories of the American culture and to the expectations of American employers. Above all, the materials introduce and instruct each individual in the expected interviewing techniques of job seeking situations in the American culture.

Review of Literature

Suggestopedia is a method developed by George Lozanov, a Bulgarian psychiatrist and educator, and has recently been introduced to language educators in the United States. This method is a dynamic, stress-free learning technique that enables one to learn a great amount of material in a short period of time. By decoding the same information in different ways while in various states of mind consciously and unconsciously, the learner makes the information far more accessible to recall. Suggestopedia, through music, role-play, games and mental relaxation techniques, taps various areas of activity in the brain.

The literature review provides support for the major component features of this method. Most studies have demonstrated that students can be taught a foreign language approximately two or three times faster than students in control groups with a similar amount of lan-

guage acquisition and achievement. Most research studies that have been conducted to date have looked at the experimental work in languages designed to evaluate the Suggestopedic approach in comparison with conventional teaching methods (Bordon & Schuster, 1976; Caskey, 1986; Gritton & Bordon, 1976; Kurkov, 1976, Schuster, 1976). Other research (Bordon, 1976, Caskey, 1976, Prichard & Taylor, 1976) have investigated the effectiveness of the Suggestopedic approach. In addition, experimental work has also been conducted in different countries, such as Canada (Racle, 1973, 1974, 1975) and Iran (Schaffer, 1977).

The first experiment utilizing the theory of suggestology and suggestopedic applications was in the teaching of Russian (Kurkov, 1971). The progress achieved by the experimental and control groups was measured by the Modern Language Association (MLA) Cooperative Foreign Language Test and a course test. The experimental group covered twice as much material in the same time as the control group. The results indicated that the students instructed with the Suggestopedic approach learned with less effort and retained their knowledge better than the students of the control group.

The next study was conducted by Bushman (1976) and utilized a controlled laboratory design for teaching Finnish to 41 graduate students. This study involved three instructional treatments: full Suggestopedia, modified Suggestopedia where music and easy chairs were deleted, and conventional instruction. Students' achievements in vocabulary, grammar, pronunciation, and communication were measured. The results showed that the Suggestopedic groups performed significantly better than the control group, especially on the communicative measure. The two Suggestopedic groups, however, did not vary significantly.

Studies (Bordon & Schuster, 1976; Caskey, 1976; Schuster, 1976) examined college students learning Spanish by means of the Lozanov suggestive-accelerative method. The results showed that the students in the experimental group learned Spanish as well as those in the control groups in one-to-three, or one-to-seven acceleration of learning. Caskey's (1976) study assured that students instructed in the Suggestopedic approach generally showed a positive attitude toward learning.

In addition to the studies that investigated the effectiveness of the Suggestopedic approach at the college level, Gritton & Bordon (1976) conducted a research study at Wilson Jr. High School in Iowa. The results, based on adjusted posttest scores, showed that the experimental group students were significantly higher in achievement test scores than the control group. These researchers concluded that the Lozanov method has considerable potential for improving classroom learning.

Prichard and Taylor (1976) investigated the effects of the Suggestopedic techniques on 20 remedial reading students who were judged two years below their reading expectancy according to Spache Oral Silent reading scores. After a 14-week program, these students achieved overall gain scores of about a year or more on both oral and silent reading, and on word recognition subtests.

Canadian experience with Suggestopedia began in Sofia in the fall of 1972, examining a team who were trying to learn French from the Public Service Commission of Canada. The results of Racle's (1973, 1973, 1974) studies showed that students with the least initial knowledge made the greatest gains and students with the lowest Modern Language Ability Test (MLAT) scores also made the greatest gains. Moreover, students were

motivated to continue their training by this method. Fuerst (1976) conducted a study at the Public Service Commission of Canada in the fall and winter of 1975, observing the students' behavior and student-teacher interaction while learning French through the Suggestopedic approach. In observing the students' behavioral change, Fuerst stated that with the increase of personal involvement and spontaneous exhibition of individual personality, students became increasingly "themselves." It was suggested that students' changing behavioral patterns differed from those in "traditional" teaching methods. The findings of the Canadian studies indicated that the Suggestopedic method is applicable in cultural contexts other than Bulgarian; namely, Suggestopedia, can be adaptable to societies with different cultural and educational norms.

Besides the experiments conducted in the United States and Canada, a study by Schaffer was attempted at Ferdowsi University in Meshed, Iran, in the fall of 1976. The measuring device for the pre- and posttest included written dictation and oral interviews. The test results showed that there was no significant difference between the experimental and control groups. In the Iranian case, the method did not succeed in securing the confidence of those using the method. The adaptability of the Suggestopedic approach to the Iranian context needs further experimentation.

In summary, Suggestopedic, or the Lozanov method, has been evaluated and experimented with from different fields, such as foreign languages, language arts, reading, spelling, math and science. In the past decades, this methodology has been experimented with in the United States public school systems and the various components evaluated in laboratory studies with college students. The studies consistently showed that students

instructed with the Suggestopedic approach scored significantly higher than those instructed with the conventional approaches. The literature review has provided support for the major component features of the method. Most studies demonstrated that students can be taught a foreign language approximately two or three times faster than students in control groups with a similar amount of language acquisition and achievement.

THE CLASSROOM STUDY

Purpose

This study was designed to investigate and evaluate the effectiveness of the Suggestopedic approach in teaching English as a second language to Southeast Asian and East African refugees in San Francisco. The research questions addressed are as follows:

1. Is there a significant difference in the English achievement scores as measured by Structure Test, English Language (STEL) among adult immigrant learners instructed in the Suggestopedic approach and in the non-Suggestopedic approach?
2. Is there a significant difference in the English achievement scores as measured by STEL between two groups of adult immigrant learners instructed in the Suggestopedic approach?
3. Is there a significant difference in the achievement scores as measured by Vocabulary Inventory Test (VIT) between the two groups of adult immigrant learners instructed in the Suggestopedic approach?

Research Design

The study employed an evaluative pretest-posttest group. Subjects were from the Refugee Women's Program and the San Francisco Community College Centers. There were 38 limited-English speaking students from several major language groups attending the Housekeeping Project in San Francisco during the academic year of 1984/1985. Students in the two Suggestopedic groups received one-and-a-half hours of instruction every day, five days a week for eight weeks. Total instructional time thus was 60 hours. Twenty students instructed with the Suggestopedic approach during the months of June and July of 1984 will hereafter be referred to as Suggestopedic Group A. The second group, consisted of a corresponding sample of 18 students enrolled in the program during the months of February and March of 1985. In Suggestopedic Group B, only 14 students completed the program. Three students considered as employable were placed in job-training before the end of program. One student dropped out at the sixth week for an unknown reason. Although random assignment was not possible, the students were comparable in language and socioeconomic backgrounds. The students' language background in both Suggestopedic groups were mainly Lao/Mien, Ethiopian, Vietnamese, and Khmer. More than 50 percent of the students were literate in their native languages, but only a few students (20%) received a high-school education. Eighty percent of students were under 35.

Because no control group was available, a local norm group was established for the additional comparison. The local norm group consisted of 600 students from the San Francisco Community College Centers where conventional approaches in teaching English as a second language were used. Students of local norm group were taught two hours a day, five days a week

for 18 weeks. Total instructional time thus was 180 hours. According to the San Francisco college census, the the students in the local norm group were comparable to the two Suggestopedic groups in terms of age, language and socioeconomic backgrounds, and initial English proficiency.

Instrumentation

The Structure Test, English Language (STEL) and the Vocabulary Inventory Test (VIT) were used to assess students' English proficiency and administered before and after the eight-week instructional period. In addition, an evaluation form was was administered to Suggestopedic Group B at the end of the program.

The STEL was designed by Best and Ilyin in 1976 to assess the fluency of adult ESL learners in English grammar. This test was oriented entirely toward grammar placement and utilized knowledge of written grammar. The KR-20 reliability of Forms 1 and 2 are .88 and .90 respectively which is within the accepted range. Pearson Product Moment correlation was also used to ensure that the two forms were correlated and yielded a coefficient of .81 based on 106 students. Because the two forms were not perfectly correlated, they should have been equated to yield equivalent scores. In light of this problem in the equating of two forms, only one form was used to interpret the results in this study, although two forms were administered to the Suggestopedic Group B students to see if the scores on both forms were comparable.

The other instrument used in this study was the VIT. The test was designed by the course instructors and validated by the researcher as an aid for the Housekeeping Training Project at the Refugee Women's Program. This test can be employed as a brief measure of

verbal comprehension and usage for assess students' ability to use the appropriate vocabulary in job-related situations.

The test consists of 50 three-alternative multiple-choice items. Test construction was initiated by the compilation of a pool of 72 items from which 50 items for the achievement test were selected based on whether an item was the essential word for students to know. The whole test was intended to measure the level of each student's achievement in the study of vocabulary. Fifty items were allocated to tap three of the levels of Bloom's taxonomy; i.e., knowledge, comprehension, application. Because this instrument was designed for low-level ESL students who are preliterate or semiliterate in their native languages and English, the test itself does not attempt to tap the rest of the cognitive ability levels, such as analysis, synthesis, and evaluation.

In addition to the STEL and VIT, an evaluation form was administered to the Suggestopedic Group B. The evaluation form consisted of two parts. The first part related to how students felt about the use of music in the classroom and what type of music they liked most. The second part consisted of several general questions about the students' attitudes toward learning.

Data Collection

Students in the two Suggestopedic groups were given the STEL Beginning Level Form 1 as a pretest and Form 2 as a posttest. In addition, Suggestopedic Group B students were also given Form 1 to examine if there was significant difference in performance for those students who took both forms of the STEL after the treatment. The VIT was administered to the two Suggestopedic groups after the training period to assess

the students' abilities to use the appropriate vocabulary in job-related situations. The total scores were computed by summing the correct answers. In addition to the data from the two Suggestopedic groups, the STEL data were collected from the San Francisco Community College Centers. There were 600 tests scored and used as a local norm so that the results of English achievement from the Suggestopedic groups could be compared with those individuals instructed in the more traditional ESL teaching methods.

Data Analysis

The data gathered for each of the three groups were independently analyzed. In order to answer the research questions, dependent *t* and independent *t* tests were used on the data. The .05 level of confidence was used as the criterion level for determining a significant difference. Comparisons between the non-Suggestopedic and Suggestopedic Group A or B in terms of proficiency level, namely ESL 100 and ESL 200, were made. The results of the independent *t* test analyses of the student outcomes were comparable. In addition, the results of STEL and VIT were compared between the two Suggestopedic groups using the independent *t* test. Aside from these comparisons, the dependent *t* test was also used for determining the gain scores between the pre- and posttesting within each Suggestopedic group.

Results

The analysis of data provided the following results:

1. The comparison of the posttest scores between each of the two Suggestopedic groups and the local norm group (see Table 1) revealed that students in both Suggestopedic groups, on the average, scored statistically higher on the posttest than did the local norm group.

Table 1. Analysis of STEL (Form 2) Scores by Groups

Statistics	G R O U P		
	Suggestopedic A	Suggestopedic B	Local Norm
Mean	26.40	36.50	23.47
SD	4.52	6.72	9.28
N	20	14	320
t	2.58*	6.97*	
df	30.19	5.25	

*Significant at the .05 level vs the Local Norm Group

The Suggestopedic Group A was the closest to the mean for community college students as reported by Best and Ilyin (1976). Although not far from the average mean value for the local norm group, the mean for Suggestopedic Group B is almost one standard deviation above the Best and Ilyin sample value.

Because the probability value for the two comparisons with the local norm group meets the criterion for significance, that is, $p < .05$, the null hypothesis was rejected in favor of the alternative. The gains between pre- and posttest scores provide evidence that Suggestopedic groups of students instructed for eight weeks learned as much as, or even more than, those students from the local norm group instructed for 18 weeks.

2. The comparisons of STEL scores (see Table 2) between the two Suggestopedic groups revealed that both groups gained an average of about 7 points from pre- and posttesting under the Suggestopedic approach,

although the two Suggestopedic groups neither started at the same level of proficiency in grammar nor achieved the same proficiency level at the end of the program.

Table 2. Means and Standard Deviations on the STEL for the Two Suggestopedic Groups

Group	Statistics		
	Mean	SD	N
<i>Pretest (Form 1)</i>			
A	19.60	4.20	20
B	27.64	6.69	14
<i>Posttest (Form 2)</i>			
A	26.40	4.52	20
B	36.50	6.72	14
<i>Posttest (Form 1)</i>			
B	34.71	7.62	14

The means and standard deviations for pretest and posttest are found in Table 2. At posttest, it was determined that there was no significant difference between the scores on the two forms for Suggestopedic group B. The average gain made by Suggestopedic Group B, using the same form for both tests, was 7.07, which was significant at the .05 level ($t=4.11$, $df=13$). Although the same comparison was made for Group A, it should be interpreted with caution as the forms used were not the same. If, however, the same results holds for Group A, the average gain of 6.80

was found to be significant at the .05 level ($t=13.73$, $df=19$).

3. Comparing the posttest scores for the two Suggestopedic groups resulted in a significant difference at the .05 level (See Table 3).

Table 3. VIT Means and Standard Deviations for Two Suggestopedic Groups

Group	Statistics				
	Mean	SD	N	t	df
Posttest					
A	28.40	10.33	20	3.53	32
B	39.86	7.55	14		
Pretest					
B	21.36	7.67	14	9.17	13

The difference between the two posttest means was 1.25 of the within-group SD, or about 11 vocabulary words on the average, which is similar to the difference in posttest performance on the STEL. The comparisons of VIT scores between pre- and posttesting of the Suggestopedic groups revealed that Group B had an average gain of 19 points. Although there was no pretest given to Suggestopedic Group A, it might be inferred that the average performance gain for this group was comparable to that of Group B given the similar gain on the STEL by both groups. Because the

pretest performance on the STEL for Group B, the same discrepancy would be assumed on the VIT.

4. The data obtained from the evaluation forms completed by Suggestopedic Group B showed that a) all of the students were convinced that music did soothe their minds, especially piano concertii, b) the majority of the students ranked vocabulary as the course content they liked most and also the area in which they improved the most, which was followed by grammar, and c) all the students reported feeling relaxed and good after class, although the class was conducted in the afternoon.

Discussion

The findings of this study were congruent with most of the research that has been done in the past to examine the effectiveness of the Suggestopedic approach in teaching foreign languages at the college level. In general, the results of this study showed that most students in the two Suggestopedic language skills over the 8 weeks of instruction. The finding is also in line with most research findings, that is, the Suggestopedic approach accelerates learning, especially in vocabulary. In addition, students' achievement scores as measured by STEL and VIT were congruent with their self-evaluations. The results of this study have indicated that the Suggestopedic approach can be an effective teaching model for the limited-English-proficient students.

The differences between the pre- and posttest scores among the Suggestopedic groups of students with respect to the STEL were not as significant as they were with the VIT. These findings might be attributed to the fact that the Suggestopedic approach focuses on linguistic acts, or communicative tasks and activities, instead of the linguistic form of the language.

The STEL, consisting of discrete items, was designed mainly to measure students' English proficiency in structure. Functional language use entails the complex integration of linguistic rules in conjunction with interpersonal communication and pragmatic features of the interaction.

Other factors that may be considered as the positive findings of this study are the ways of presenting materials and the integration of both brain with mind and music. Presenting materials in a dramatic, dynamic way in Concert One and then reviving it with baroque music provided as many associations as possible to help students learn and remember the materials. In Concert Two, students were requested to make mental images. This provided visual images of kinesthetic associations to facilitate learning when the teacher read the text that the students had learned. It also helped construct the mind map as much as possible from memory and reduced the rate of forgetting; as a result, a better long-term memory could be attained. "Elaboration" played an important role in the Suggestopedic cycle. At this practice phase, students were able to apply the information to communicative tasks.

The Bridge from the Lozanov Method to American Linguistic Research and Its Implications on Language Teaching

The application of Suggestology to the foreign language pedagogy was not Lozanov's primary interest and yet he chose foreign language as a demonstration model and developed a Suggestopedic instructional model to teach adults a new foreign language in a short period of time. Three key factors of using Suggestopedia are that a large quantity of information might be effectively learned in a short period, socio-cultural barriers can be

overcome through a suggestive-desuggestive system, and importantly, learning becomes more receptive by means of the special relaxation techniques and baroque music. Although the Lozanov Method has been popularly used in Europe, its influence on the American foreign language education has been slow in coming (Dhority, 1982). As far as the originality of Lozanov's work is concerned, few people are directly acquainted with his work. There is still a lack of conclusive data demonstrating the methodological effectiveness of Suggestopedia in the U.S. The effectiveness of Suggestopedia needs further investigation together with the current American linguistic research on language learning and acquisition.

The development of Krashen's five hypotheses (Krashen, 1982) on language acquisition/learning theory helps to explain why the Lozanov foreign language model can be so effective. According to Krashen's learning/acquisition hypothesis, acquisition is essentially a subconscious process in which learners are using language for communication; whereas, learning is a conscious phenomena of knowing about "language." Conscious study of grammar rules and language structure does not help the process of acquisition (Krashen, 1982). If language teaching continues to move toward "communicative competence", it becomes more important to create a "natural or nearly genuine linguistic environment" where acquisition can take place. In Suggestopedia, the principle of infantilization helps learners regain the state of playfulness to counteract the "lock-in" cognitive paths of the adult habitual state. In addition, baroque music helps activate the right hemisphere of the brain, facilitates hypermnnesia (supermemory), and liberates the intellectual activity to operate without any disturbing strain.

In terms of Krashen's Input hypothesis, we acquire language by understanding input that is a little beyond the current level-comprehensible input. Of Suggestopedic cycles, to decode and act out the psychodrama by using teaching techniques is to ensure that the authentic target language is comprehensible, and that the context clues are rich enough so that students can easily and naturally acquire the language and move toward the next level of competence.

Affective filter is considered to be the major factor to block or facilitate acquisition. When the affective filter is high, learning cannot take place (Krashen, 1982). A low filter means that the performance is more "open" and "receptive" to the input, and thus optimal input environment can be achieved. The Suggestopedic instructional method not only supplies optimal input but also creates a low, positive affective filter through pseudopassiveness, mental relaxation, and other stress-free techniques.

As far as language instruction is concerned, it is unreasonable to hypothesize that the language acquisition device exists only before puberty. For the older child and the adult, the second-language processes will probably consist of the mixture of language "acquisition" and "learning." Thus, teachers must begin to examine teaching techniques in terms of how the techniques operate to meet the needs of the students. Classroom teachers should also be alert to tackle the learning situations. A state of fear and apprehension will undoubtedly cause a psychological block that affects the students' ability to learn. In any language class, teachers should be able to provide comprehensible input and turn the role to the students so that students will find themselves in an almost genuine communication situation. Learning a language is learning to communicate (Wilkins). Language

instruction should focus on creating a student's functional ability in the use of new language that leads to language acquisition rather than leads to learning. Especially in literacy vocational ESL classes, instruction should be functional and relevant to the learners' survival needs. Thus, situational dialogs are considered as one of the effective techniques facilitating functional use of the new language. Since Suggestopedia addresses the above-mentioned issues, this teaching methodology proves to be effective for learners of all ages and varied language backgrounds.

Conclusions

The general conclusions of the study are summarized as follows:

1. The Suggestopedic approach in 8 weeks (60 hours) was effective and produced greater achievement than the 18-week program (180 hours) of the Community College Centers.
2. The use of baroque music soothed students' minds; a state of joyful and relaxed concentration resulted.
3. The Suggestopedic approach facilitates learning not only for college students but also for middle-aged adult immigrants.

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Suggestopädie: Eine suggestiv-beschleunigte Lehrmethode für Vermittlung von Englisch als zweiter Fremdsprache.

Die Geschichte der Sprachlehre beinhaltet eine breite Spanne der Methoden. Es gibt wenig Übereinstimmung, welche Disziplinen am wesentlichsten sind. Die Literatur, die sich mit Zweitsprachen-Entwicklung befaßt, weist zwei Prozesse aus, durch die der Einzelne eine grundlegende Befähigung zur Kommunikation erreichen kann. Es wird nahegelegt, daß jede Betrachtungsweise, die sich mit dem Erlernen sowohl als auch mit dem Lernprozeß befaßt, erfolgreich sein wird. Suggestopädie ist eine Methode die das Erlernen der Zweitsprache auf natürliche Weise fördert, mit dem Schwerpunkt auf kommunikativer Kompetenz und realistischer (natürlicher) Sprechweise.

Le "Suggestopédie": Une Technique d'Enseignement Suggestive et Accélérée pour l'Enseignement de l'Anglais comme Seconde Langue.

L'histoire de l'instruction d'une langue inclut une grande diversité de méthodologies. En ce qui concerne l'efficacité des techniques d'enseignement, il y a eu peu d'accord quant à quelles disciplines sont essentielles. La littérature sur le développement d'une seconde langue identifie deux processus par lesquelles chaque individu peut développer une compétence de base dans la seconde communication dans l'apprentissage et l'acquisition d'une seconde langue. Il a été proposé que n'importe quelle méthode d'attaque qui s'occupe de la langue et qui se concentre à la fois sur l'acquisition et sur l'apprentissage sera bénéficiaire. La "suggestopédie" est une méthode d'attaque qui facilite l'acquisition naturelle d'une seconde langue avec l'accent sur une compétence dans la communication et sur un usage pragmatique.

Sugestiopedia: Una Técnica de Enseñanza Acelerada Sugestiva en la Enseñanza del Inglés como segunda lengua.

La historia de la enseñanza de lenguas incluye una gran variedad de metodologías. Referente a la efectividad de las técnicas de enseñanza ha habido poco acuerdo en cuales son las disciplinas esenciales. La literatura del desarrollo de la segunda lengua identifica dos procesos mediante los cuales cada individuo puede desarrollar una competencia de comunicación básica en el aprendizaje y adquisición de la segunda lengua. Se ha propuesto de que cualquier aproximación que trate con la lengua y que se enfoque tanto en la adquisición como en el aprendizaje ser fructífera. Sugestiopedia es un acercamiento que facilita la adquisición de la segunda lengua de una forma natural, dando énfasis en la competencia comunicativa y en las frases reales.

**Effects of Relaxation Training on Verbal Ability,
Sequential Thinking, and Spatial Ability***

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Abstract. The aim of this study was to investigate how verbal ability, sequential thinking, and spacial ability are affected by long-term relaxation training. Approximately 319 Swedish conscripts and cadets (males, 19 to 21 years old) participated in two studies consisting of 25 relaxation sessions over a period of three months. At the conclusion of the relaxation training program both studies noted improved performance on verbal and numerical-sequential tests as well as on visiospatial tests. The results were evaluated against recent findings concerning cerebral dominance.

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Introduction

The present study addresses the possibility of change in the primary mental abilities of normal, nonclinical adults through a systematic practice of relaxation. Recent research suggests that relaxation training may affect certain functional abilities of the left and right cerebral hemispheres. In this study no differentiation will be made concerning the various relaxation techniques. Advocates of the different "schools" frequently claim unique (and remarkable) results. However, Setterlind (1983) in an extensive research overview concluded that all techniques lead to similar physiological, psychological, and behavioral (and less remarkable) results. No method seems to be universally superior and choice of technique should ideally be left to the individual.

Longitudinal studies of children and adolescents display a considerable stability for intelligence. The highest stability coefficients are found in male youth on verbal and spatial ability (Magnusson & Backteman, 1978). The development of the primary mental functions spatial and verbal ability seems to cease prior to the age of 20 (Berglund, 1965; Bloom, 1964; Tyler, 1965). Further development of these abilities has mainly been studied in connection with educational and vocational experiences. The results show that a limited degree of change in ability occurs after education corresponding to that ability, though the rivalry hypothesis based on self-selection can not be rejected (Balke-Aurell, 1982; Guilford, 1967; Kohn & Schooler, 1973, 1978; Meuris, 1970; Nichols, 1964). It has also been suggested that verbal and numerical abilities are more closely related to educational experiences as opposed to spatial ability, which is learned experientially in a nonstructured environment (Doppelt & Bennet, 1951; Meyer & Bending, 1961). Sociocultural changes have also been found to have a small effect on basic mental abilities (Ferguson, 1956; Harnqvist, 1978).

Support for the assertion that verbal ability and sequential thinking primarily occurs in the left hemisphere, and spacial ability in the right hemisphere, can be found in the research (Allen, 1983; Broadbent, 1974; Eccles, 1977; Galin, 1974; Gardner, 1978; Greenwood, Wilson & Gazzaniga, 1977; Rubenzer, 1979; Sperry, 1983; Springer & Deutsch, 1982). Evidence of cerebral lateralization is strongest for verbal functions (Lenneberg, 1976) and sequential processing (Cohen, 1973). Researchers claim that visiospatial functions are primarily carried out by the right hemisphere (Allen, 1983). From an EEG study Willis, Wheatley, and Mitchell (1979) claim that hemispheric processing is a function of task demands and not just related to perceptual requirements (e.g., language for the left and spacial forms for the right hemisphere). Galin (1974) maintains that the hemispheres are not specialized to work with different types of material; rather, each hemisphere is specialized for a different cognitive style. Thus, the left hemisphere has an analytic mode for which words are an excellent tool, and the right hemisphere has a holistic mode, for which spacial relations are particularly suitable.

The question of shifting cerebral dominance during different states of arousal and consciousness has attracted considerable interest; however, the results of EEG studies are inconclusive. Most research indicates a left side dominance during the state of ordinary wakefulness, and a right side dominance in the dream state (Galin, 1974) and during relaxation or meditation (Bakan, 1969; Blumberger, 1978; Gur & Reyher, 1973; Gur & Gur, 1974; Rubenzer, 1979). During relaxation or meditation (after a period of practice) one is said to reach an altered state of consciousness (Korn & Johnson, 1983; Setterlind, 1983). EEG studies indicate that a deeper level of rest is reached during this state than during ordinary sleep (Brown, 1970; Danskin, 1981; Gir-

dano & Everly, 1979; Kimaya, 1969). However, the literature is not consistent concerning lateralization in the dream state (Greenwood, Wilson, & Gazzaniga, 1977). Furthermore, Bennet and Trinder (1977), in an EEG study of the effects of transcendental meditation failed to notice any lateral asymmetry with respect to the distribution of alpha activity. Advocates of right hemisphere dominance during periods of sleep and relaxation claim that the right hemisphere utilizes this state to express itself.

In summary, previous research indicates, with reasonable certainty that: a) the primary mental abilities are fully developed at the age of 20, b) the left hemisphere is dominant on tasks requiring verbal ability and sequential thinking, while the right hemisphere remains dominant on tasks requiring spacial ability, and, with less certainty c) during periods of rest, for instance, sleep or deep relaxation, the right side dominates the left. If this is correct, it could be assumed that relaxation training enhances and more fully utilizes potential activities conducted by the right hemisphere. Rubenzer (1979) makes the same assumption but offers no empirical evidence. Utilizing these assumptions, the aim of this study was to test the following hypothesis: long-term relaxation training leads to performance improvement on tasks requiring spacial ability, but it does not affect performance on tasks requiring verbal ability or sequential thinking.

METHOD

Design

The experiment was conducted twice, the second was a replication of the first. Two separate groups of subjects (see below) participated in each of the studies. At the age of 18 the Swedish enlistment examination was given to all subjects; verbal and spacial ability was

tested. About one year after this examination the subjects in the first experimental setting began their military basic training which is compulsory for all males in Sweden. About two years after this examination the subjects in the second experimental setting began their cadet training, for which they had volunteered. From the beginning of their respective training sessions, one group ("experimental") took part in regular relaxation training (see below). Another group ("control") was conventionally trained, i.e., they did not have any relaxation training. After three months of training the experiment was performed; all subjects received a test battery (see below).

Study 1

Subjects

All subjects were males, 19 to 20 years old, serving as conscripts in the Swedish Army. The experimental group consisted of the conscripts of five platoons ($n=97$) and the control group consisted of the conscripts of two platoons ($n=45$).

Relaxation training

From the start of their military service, the conscripts in the experimental group received a systematic relaxation training program. The first session consisted of a tape recorded program of Jacobsen's (1929) progressive relaxation technique. After 15 such sessions more passive techniques were introduced (autogenic training). The subjects could then choose between a simple meditation technique (Benson's "one"-meditation, 1975), or a program consisting of a short instruction phase followed by a sequence of flute music. At the time of the study the subjects in the experimental group had taken part in approximately 25 relaxation training sessions. A full description of the relaxation training program is presented elsewhere (Larsson, 1987).

Left hemisphere tests

The selection of tests (including right hemisphere tests, see below) was inspired by the test battery used by Gordon, Silverberg-Shalev, and Czernilas (1982). The tests have split-half reliabilities and Cronbach alpha coefficients greater than .70. All tests were designed for group administration.

L 0. Enlistment examination verbal test: A conventional verbal test (synonym; maximum 40 correct answers) whereby scores were transformed to z values and used as a pretraining assessment.

L 1. Serial numbers: Seven series of 3 to 9 digits were played on a prerecorded tape at the rate of 1 digit per second. At the end of each series the subject was instructed to write the sequence of numbers in the order they heard it. The scoring favored the number of digits in the correct order regardless of whether the sequence was correct (maximum 42).

L 2. Verbal ability: A conventional test (synonym) previously used in the selection of Swedish officers (Test booklet, 1961) was used. The scoring consisted of the number of correct answers (maximum 25).

L 3. Verbal fluency: The subject was instructed to write as many words (Swedish) as possible in a two minute period that begins with the letter "S" and ends with the letter "A".

A composite left hemisphere score was calculated as follows. The raw score on each of the three subtests was transformed (z value). The average of these transformed scores constituted the subject's composite left hemisphere score.

Right hemisphere tests

R 0. Enlistment examination spacial test: A conventional spacial test (folding; maximum 40 correct answers) whereby scores were transformed to z values and used as a pretraining assessment.

R 1. Localization test: An "X" was marked within a large black frame projected from an overhead projector for three seconds. The subject had to mark the location of the "X" within a similar frame on an answer sheet. The error (distance in mm) between the centre of the correct "X" and the centre of the response "X" was the score. To demonstrate that high scores reflect good performance and low scores reflect poor performance, scores were then transformed by a subtraction of the error score from the constant 100.

R 2. Gestalt completion test: A silhouette picture of a rider on a horse (from the Street Gestalt Completion Test), in which random parts of the picture had been erased, was presented with an overhead projector for 15 seconds. The subject was asked to imagine the picture completed, and to write it down. A correct answer was given two points. A partly correct answer, where either the horse or the rider was identified, was given one point. All other answers received no points.

R 3. Spacial ability: A conventional test (levers) previously used in the selection of Swedish officers (Test booklet, 1961) was used. The scoring consisted of the number of correct answers (maximum 30).

A composite right hemisphere score was calculated as follows. The raw score on each of the three subtests was transformed (z value). The average of these transformed scores constituted the subject's composite right hemisphere score.

Procedure

Prior to each test, instructions were given and questions answered. The six tests were presented one after another with brief rest periods between each. The right hemisphere tests were presented first. The tests were completed anonymously. This disallowed any intra-individual comparisons with the pretraining assessment (the enlistment examination). The names of the participants were known however, and thus group comparisons could be made on the results from the enlistment examination. The entire administration including instructions and rest periods lasted about 45 minutes.

Study 2

Subjects

All subjects were males, 20 to 21 years old, attending cadet school in the Swedish Army. The experimental group consisted of 68 cadets (two platoons) and the control group consisted of 109 cadets (three platoons).

Materials

The test materials were changed in the second experimental setting as follows: the verbal L 2 (synonym) and spacial R 3 (levers) tests used in the first experiment were replaced by the verbal and spacial tests used at the enlistment examination (maximum 40 correct answers on both these tests). Thus, the same tests were used for assessment of pretraining status and effects of long-term relaxation training.

Results

No significant differences on right or left handedness was found between experimental and control groups. Approximately 92% of the subjects were right handed and 8% were ambidextrous or left handed.

Table 1 shows that no significant differences were found in either Study 1 or Study 2 between the means of the experimental and control groups on the pretraining assessment. This was predictable because selection requirements for Swedish conscripts and cadets are specific--therefore, those in a given position generally have similar physical and psychological characteristics. When compared with all male Swedish 18 years olds, the subjects in Study 1 had stanine scores of about 5.6 on verbal and spatial ability. In Study 2 both groups had stanine scores of about 6.8.

Table 1 shows that the experimental group in Study 1 had significantly better results than its control counterpart on the left hemisphere composite score ($t(140) = 3.42, p < .01$) as well as on the right hemisphere composite score ($t(140) = 3.25, p < .01$).

The experimental group in Study 2 had a significantly better result than its control group on the left hemisphere composite score ($t(175) = 2.30, < .05$) as well as on the right hemisphere composite score ($t(175) = 3.48, p < .01$).

Due to the risk of chance errors when multiple significance tests are performed, such tests were only conducted on aggregated test scores. However, an examination of the separate subtests revealed that the differences between relaxation and nonrelaxation groups were evenly distributed across all subtests.

Discussion

The aim of this study was to investigate how verbal ability, sequential thinking, and spacial ability are affected by long-term relaxation training. Performance improvements on spacial tests were predicted and found. Per-

Table 1. Scores on mental tests before and after relaxation training

		Experimentals		Controls			
		Assessment Test	Mean	SD	Mean	SD	t
Study 1		Pretraining verbal ...	-0.09	1.15	0.19	0.67	0.39
E-group (n=97)	Pretrain. spatial ...	-0.06	1.11	0.13	0.76	0.30	
C-group (n=45)	Posttr. composite ...	0.45	0.91	-0.97	1.20	3.42**	
	left hemisphere						
	Posttraining composite ...	0.40	0.93	-0.86	1.16	3.25**	
	right hemisphere						
Study 2		Pretraining verbal ...	-0.07	1.03	0.04	0.98	0.19
E-group (n=68)	Pretrain. spatial ...	-0.11	1.06	0.07	0.96	0.26	
C-group (n=109)	Posttr. composite ...	0.51	0.94	-0.32	1.04	2.30*	
	left hemisphere						
	Posttraining composite ...	0.68	0.87	-0.42	1.07	3.48**	
	right hemisphere						

Note: All scores are z values.

a: t test of differences between independent group means.

*: $p < .05$, **: $p < .01$

formance improvement following long-term relaxation training on verbal and numerical-sequential tests was not anticipated.

A possible explanation of the unexpected performance improvement on tests designed to measure verbal ability and sequential thinking is that these tasks did not require lateralized processing as assumed. A second possibility is that long-term relaxation training actually affects dual hemisphere capacities and is likely to increase learning efficiency in a variety of ways. A third possibility is that relaxation reduces anxiety caused by the test situation and thereby enhances performance. Simultaneous assessment of state anxiety would thus have been desirable. Obviously, the suggested linkage of mental abilities and the effects of relaxation training on hemispheric differentiation can only be validated by a neurological study.

Elsewhere (Larsson, 1987), the risk of a Hawthorne effect among the subjects in the present study has been considered minimal (based on extensive interview data). Subjective observations during the experimental test sessions indicated that the subjects seemed to be highly ambitious and serious. The lack of random selection and group assignment of subjects poses a threat to the study that is only partly addressed by the pretests. Other relevant control variables such as anxiety and SES should ideally have been included.

The following additional information concerning this study needs to be presented. First, "long-term relaxation training" consisted of about 25 relaxation sessions spread over a three month period. However, little is known about the effects of considerably longer periods of relaxation training, or how susceptible the results are to extinction if one ceases training. Second, all subjects

in the present study were young males who were above average physically and mentally. A suggestion for future research is to study the effects of relaxation training on individuals with mixed characteristics, for instance, age, sex, physical and mental status, social background etc. Setterlind (1983) claimed that individuals who demonstrate high levels of anxiety at the onset of long-term relaxation training will benefit most from the training. If this holds true for improved performance on mental tests, stronger results than those obtained in the present study can be expected.

The practical value of this experiment is impossible to assess on the basis of this study alone. On the behavioral level, multiple external causality factors may affect changes in the mental processes. Simultaneous assessments of performance on mental tests and actual task performance are needed for this kind of inference. Actual task performance data were obtained from the subjects in the present study (presented in Larsson, 1987). The data indicate that improved performance on mental tests following relaxation training was accompanied by performance improvements on actual tasks of a perceptual-motor and cognitive character.

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Auswirkungen von Entspannungsübungen auf verbale Ausdrucksfähigkeit, logisches und räumliches Denken.

Das Ziel dieser Untersuchung war zu ergründen, wie verbale Fähigkeit und räumliches und zeitliches Denken durch ein langzeitiges Entspannungsübungen beeinflusst werden. Annähernd 319 schwedische Wehrdienstpflichtige und Kadetten (männlich, 19-21 Jahre alt) nahmen an zwei Forschungsstudien teil, die aus 25 Entspannungssitzungen, über eine 3-monatige Periode verteilt, bestanden. Am Ende des Entspannungsübungsprogrammes zeigten beide Untersuchungen verbesserte Leistung bei verbalen, logischen, sowohl als auch räumlich-visuellen Tests. Die Resultate wurden an Hand der neuesten Ergebnisse auf dem Gebiet der cerebralen Dominanz ausgewertet.

Les Effets d'un Entraînement de Relaxation sur la Capacité Verbale, le Raisonnement Séquentiel, l'Habileté Spaciale.

Le but de cette étude était d'investiguer comment la capacité verbale, le raisonnement séquentiel, et l'habileté spaciale sont affectées par un entraînement de relaxation. Environ 319 conscrits et cadets Suédois (hommes de 19 à 21 ans) ont participé dans deux

études qui comprenaient 25 sessions de relaxation réparties sur une période de 3 mois. A la fin du programme d'entraînement pour la relaxation les deux études ont révélé une performance améliorée à la fois dans les tests verbaux et les tests séquentiels numériques aussi bien que dans les tests spaciaux visuels. Les résultats ont été comparés aux découvertes récentes se rapportant à la dominance cérébrale.

Los Efectos de la Relajación. Entrenamiento de la Habilidad Verbal, el pensamiento encadenado y la Habilidad Ambiental.

El motivo de este estudio fue el de investigar como la habilidad verbal, el pensamiento encadenado y la habilidad espacial eran afectados por un entrenamiento de relajación a largo plazo. Aproximadamente 319 reclutas y cadetes suecos (varones entre 19 y 21 años de edad) participaron en dos tipos de estudio que consistían en 25 sesiones de relajación superior a un periodo de tres meses. Al final del programa de entrenamiento de relajación ambos estudios mostraron un aumento en la realización de los exámenes verbales y numerico-encadenados al igual que en los exámenes de observación del ambiente. Los resultados fueron evaluados en contraste con recientes investigaciones referentes a las partes del cerebro más dominantes.

**The Effect of Music-Assisted Relaxation and
Mental Rehearsal Training on Introductory
Piano Instruction***

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Abstract. Two teaching methods of class piano instruction were compared to determine which method was the more effective in teaching beginning piano skills to fourth-grade inner-city children. Twenty-four environmentally deprived fourth-grade students were selected from three Midwestern urban public elementary schools and were then randomly assigned to one of two groups, 12 students in each group. Group 1 received music-assisted autogenic relaxation, mental rehearsal training; Group 2 received no autogenic relaxation, mental rehearsal training. Students were rated weekly and on a final piano proficiency examination by the investigators. As a final for the study, the students were rated on a recital performance by two metropolitan area piano teachers not previously associated with the study. The data were analyzed using a t-test for independent groups. Mean scores for Group 1 were statistically significantly higher than mean scores for Group 2 for weeks one, two, three

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and for the final piano proficiency examination. These results substantiated the hypothesis that music-assisted autogenic relaxation, mental rehearsal training does improve the acquisition of music performance skills for young children. In addition, through this project, the inner-city environmentally deprived children benefited from the opportunity of learning a worthwhile leisure skill, a general cultural enrichment, and a heightened self-esteem.

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Introduction

How does the addition of music-assisted autogenic relaxation-mental rehearsal (MAARMR) affect skill acquisition? A review of the literature indicates that different learning assistance techniques do affect levels of learning and some research indicates that learning is accelerated through the use of relaxation and visualization (Johnson, 1982; Lozanov, 1978; May, in press; Ostrander and Schroeder, 1979; Russell, 1979; Schultz and Luthe, 1959; Sheikh, 1984; and Stein, Hardy and Totten, 1982). The purpose of the present research was to compare the effectiveness of MAARMR and no MAARMR training in beginning class piano instruction.

A type of learning sometimes referred to as Superlearning or accelerated learning is believed to take place when the body and mind are working in harmony. This holistic approach to learning requires a relaxed body free from inhibiting tensions, fears, and negative, critical thoughts plus both hemispheres of the brain working together.

To understand the implications of these learning techniques, it is necessary to understand the meanings

attached to the words "relaxation" and "imaging" as they apply. Bonny and Savary (1973) define relaxation in these instances: "When...muscle pairs are in balance--neither pulling nor pushing, yet ready to go either way--they are in equilibrium...When the muscles of the entire body are in this state of balance...the body is totally relaxed" (p. 23). Relative to mental imaging used in these techniques, Eisner (1982) pointed out that all of a person's senses are utilized in the learning process and that "The formation of concepts depends upon the construction of images derived from the material the senses provide:

Through imagination--the creation of mental images-- we are able to conceive what we have never experienced in the empirical world...knowing depends upon experience, either the kind of experience that emanates from the sentient being's contact with the qualities of the environment or from the experiences born of the imagination (Eisner, 1982, p. 31).

Many athletes are using relaxation and mental rehearsal techniques. Russell (1979) defined the imagery practiced by athletes as: "a sensory-type experience in the mind without an actual corresponding situation providing the immediate sense stimulus.... To create a mental image is to imagine...This ability to put common images together in the mind to create new images is invaluable, if not essential, to the process of memory" (pp. 110-111).

Preparatory to imaging and mental rehearsal in the field of sports, May (in press) stressed the importance of relaxation "Playing some calming, meditative music before, during and after the instruction...can make the experience more beneficial" (p. 15). "Mental rehearsal

simply involves practicing as a visual image, an athletic technique, procedure, or event in one's mind...Coupling the relaxation exercises with mental rehearsal helps reduce the stress while visualizing competition. Then when in competition, relaxation is already associated with carrying out that event. Athletes have found this technique to be very helpful in controlling stress levels and maximizing performance" (May, in press, pp. 22-23). May pointed out that it is essential to image the anticipated event as realistically and vividly as possible. When applicable, people should utilize as many of the five senses as possible in their imaging. For example, you will visualize but at the same time bring in the sense of touch, smell, hearing and taste to feel the experience as much as possible. ...Visual imagery is the first step before mental rehearsal, and being able to specifically visualize the situation as totally as possible is very important (p. 22).

Wilson (1982) drew attention to the similarities between musical and athletic performance. However, a search of the literature for the period 1975 to present revealed a dearth of research directly pertinent to the teaching of music skills using accelerated learning techniques. It should be just as important for the music student to be able to visualize a perfect performance on an instrument as it is for the athlete to visualize and experience a perfect performance in an athletic event. If these techniques are working for other disciplines utilizing the effects of music, research is needed using these same techniques in the teaching of music skills.

The present study was designed to test the following hypothesis:

Fourth grade children learning beginning piano skills utilizing autogenic relaxation-mental rehearsal training will

score higher on piano proficiency examinations than fourth grade children receiving no autogenic relaxation and no mental rehearsal training.

Method

Subjects

The subjects were 24 environmentally-deprived fourth-grade students from three elementary schools located in the inner-city of a large midwestern urban area. The subjects were selected on the basis of teacher and principal recommendations and two musical aptitude tests, an equal number of students being selected from each of the three elementary schools. It was expected that those students selected would benefit by learning a music performance skill, a worthwhile leisure activity and general cultural enrichment. Following the final selection of the participants, each subject was randomly assigned to either the experimental group, Group 1 (music-assisted autogenic relaxation-mental rehearsal training, MAARMR), or the control group, Group 2 (no MAARMR training) with no differentiation as to sex, ethnic or school background. Each group consisted of 12 subjects.

Material

Two musical aptitude instruments were used in the selection process, a standardized test, the *Gordon Musical Aptitude Profile* (MAP) Test T - Tonal Imagery (1965), and the *Audition Profile* (AP, Ross, 1976). The *Bastien Primary Beginning Piano Course* (Bastien, 1976), was used as the text for the project. Acoustic pianos used by the regularly scheduled university class piano courses were used for the instruction periods during the project. A Marantz LTD 500 stereo system with a linear skating/stereo cassette deck (LD 3510) was used for the accelerated learning, experimental

group training. Baroque instrumental music averaging 60 beats per minute was prerecorded for use with the autogenic relaxation-imagery training used with the experimental group.

Procedure

Prior to the conclusion of the regular school year, recommendations for possible project subjects were obtained from the fourth-grade teachers and principals at three metropolitan area inner-city schools. Permission forms for participation in the project were forwarded to the parents/ guardians of all students. The completed forms were required to be returned to the investigators prior to the initiation of the selection process. Following the receipt of the teacher recommendations and the completed consent forms, both the Ross (1976) *Audition Profile* (AP) and the Gordon (1965) *Musical Aptitude Profile* (MAP) Test T-Tonal Imagery Musical Aptitude tests were administered by the project directors to groups of students in their regular schools to help eliminate any initial anxiety to the testing procedure. Of the 50 original applicants only 24 could be selected as participants for the current study because of space and time limitations. The students were selected on the basis of their audition scores, taking the eight students with the highest scores from each of the three elementary schools, assuring equal representation from each of the schools.

The groups were divided into three sections each and each section met three times weekly for 50-minute class lessons for a a period of six weeks. The students were taught by two university music professors and a doctoral student in piano. The participants were transported to and from the university campus from their homes, using university-owned vehicles, driven by university employees. Of the 24 students originally

beginning the program, 21 completed the weekly programs and participated in the final piano proficiency examination. Fourteen of the original participants participated in the final recital program.

Specific long-term musical achievement goals for the students during the course of the study were established as: 1) Play simple melodies with left hand accompaniment, 2) Play tonic and dominant chords in the keys of C and G major, 3) Play and transpose in the keys of C and G major, 4) Recognize and identify (aurally and visually) simple intervals, 5) Clap basic rhythmic notation and, 6) Improvise a simple melody over an harmonic structure using tonic and dominant harmonies. To measure these musical achievement goals for weekly, final examination, and recital scores, a Piano Proficiency Examination Instrument (PPEI) was designed by the investigators. This instrument was a modification of the piano proficiency examination form used for university students and the Keyboard Merits grading instrument used by the Federated Teachers of Music and Fine Arts, Inc. The Kuder Richardson-Formula 20 (KR)20 reliability for this instrument was .73. For the grading procedure, the students individually performed assigned piano performance skills which were graded numerically. The ratings used were Superior (5), Excellent (4), Good (3), Fair (2), and Inferior (1). These ratings correspond with rating scales used in national piano competitions.

The dependent variable was each student's acquisition of basic piano skills as measured by the PPEI. The student's progress on the established weekly musical skill goals was carefully documented both weekly and on a final piano proficiency examination by the instructors in both the the experimental and control groups. For this grading procedure, the students individually performed assigned piano performance skills which were graded numerically as prescribed on the evaluation instrument.

The control group was taught using the same group piano teaching techniques and text as the experimental group minus the MAARMR techniques. Instructions were given to the teacher of the control group not to use the words "relax", "imagine", "feel", "experience" or "visualize" with the students in the control groups.

The experimental group was instructed in music-assisted autogenic relaxation-mental rehearsal techniques in addition to the acquisition of piano skills. These additional learning techniques were utilized for both the opening and closing of each class period. During the first two class periods, the students were instructed in music-assisted autogenic relaxation techniques and requested to imagine or visualize favorite scenes. Beginning with the third session, the students were requested to bring forth the image of a very special piano which could be considered their own. They were then instructed to go to this very special piano, to feel its exterior, to set themselves at this piano and to begin playing their lessons perfectly. From this session forward, during relaxation-mental rehearsal at the opening of the the students were instructed to mentally rehearse the lesson they were to have for that particular session. During the closing period, the students were instructed to visualize the material which they had learned during the current session; to visualize it just as perfectly as possible, again with relaxation background music. In addition, these students were instructed to mentally practice their lessons at home since none of the students, control or experimental group, had practice pianos available.

The final for the study was a piano recital open to all students, given for their families and friends. The recital was adjudicated by two impartial area piano teachers, not previously associated with the study. The adjudicators rated the students individually on the musi-

cal achievement goals which had been established for the study.

Prior to the recital, both the control and experimental groups convened for one-half hour prior to the scheduled time of the recital to practice their normal class warm-up procedures, the experimental group practicing MAARMR techniques, the control group practicing their recital selections. Fourteen of the 21 students who had completed the weekly programs participated in this recital.

Data Analysis

The MAP and AP standard scores were tested for homogeneity between the control and experimental groups. Separate analyses were conducted to insure homogeneity between groups at the beginning of the program and again at the end to check against the affects of attrition.

Because of the difference in the number of students completing the weekly program ($N=21$) and those who in addition participated in the recital ($N=14$), the two sets of data were analyzed using the t -test for independent groups to check for significant differences in mean scores between the two groups.

Results

The groups were considered to have remained homogeneous throughout the study on the MAP and AP scores.

The t -test values that resulted from each data analysis on the piano proficiency mean scores for the two groups are tabled. Table 1 shows the results for the group of 21 students completing the weekly programs, and Table 2 shows the results for the 14 students who also had recital scores.

Table 1. Data for piano proficiency scores for all students who completed the program (N=21)

Source of Scores	Mean	Mean	SD	SD	t-value
	Group 1	Group 2	Group 1	Group 2	
Week 1	18.5	16.6	1.13	1.17	3.87***
Week 2	18.4	14.8	2.01	3.94	2.65*
Week 3	13.4	10.8	1.50	1.93	3.41***
Week 4	13.2	11.2	1.99	2.78	1.89
Week 5	20.7	17.9	3.44	3.96	1.75
Week 6	4.2	3.8	0.98	1.03	0.87
Final	88.4	76.1	9.33	10.64	2.82**

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2. Data for piano proficiency scores for recital students (N=14)

Source of Scores	Mean	Mean	SD	SD	t-value
	Group 1	Group 2	Group 1	Group 2	
Week 1	18.6	16.7	1.27	1.38	2.62*
Week 2	18.7	15.9	2.14	1.68	2.78**
Week 3	13.6	10.9	1.62	1.57	3.18**
Week 4	13.4	11.7	1.72	2.29	1.59
Week 5	21.7	18.9	3.25	1.77	2.04
Week 6	4.1	4.0	1.07	1.55	0.24
Final	90.1	78.0	9.12	7.70	2.69*
Recital	62.4	60.1	8.83	8.95	0.48

* $p < .05$, ** $p < .01$, *** $p < .001$

While the mean scores were consistently higher for Group 1 in both sets of data, the mean scores were statistically significant only in weeks one, two, and three and on the final piano proficiency examination. There was not a statistically significant difference between groups on the recital scores.

Discussion

The results indicated that the experimental group who experienced music-assisted autogenic relaxation-mental rehearsal training achieved higher mean weekly scores than the control group which did not experience music-assisted autogenic relaxation and mental rehearsal training. The findings of the present study indicate the experimental treatment did enable the students to acquire the basic piano skills faster than the students in the control group. This is consistent with the findings of Johnson (1982), Stein, Hardy and Totten (1982), and May (in press). Since the experimental group rehearsed mentally prior to the final piano proficiency examination, the results support the theory that if a person can actively create a vivid mental image prior to the actual performance of a specific task, whether it be an athletic event or a musical performance, the actual performance is enhanced. The more vivid the image, the more effective is the mental rehearsal.

The findings of the present study coincide with the ideas expressed by Bower and Hilgard (1981) that pictures, then images, then concrete facts or skills are remembered in that order, and when learned in that order, are learned much better than abstract facts or skills. The students in this study first learned to relax and to image and experience mentally as fully as possible, and finally learned to use these mental rehearsal techniques in the actual performance.

Commentary

As indicated by this study, the students who received training in music-assisted relaxation and mental rehearsal techniques learned piano skills faster and with greater ease than the students taught in piano classes without this training. Beyond these measurable results, students in the experimental group appeared to be much calmer and more cooperative with their peers and instructors. These students not only were more receptive to the learning, but exhibited an exuberance and enthusiasm which aroused the curiosity of the students in the control group, demonstrated by questions like, "When are we going to learn to relax?"

All of the students in this study benefitted from learning a worthwhile leisure skill as well as the opportunity for aesthetic expression. Further, these children from an inner-city environment were familiarized with a major urban university, and experienced the support and encouragement of teachers and other university personnel. The enhanced self image was evidenced in every child as he/she beamed with pride and self-satisfaction following the many highly praised performances.

This project culminated in a public recital attended by families and friends which turned out to be a joyous occasion for everyone. The children were glowing with pride in themselves and their accomplishments as they each announced and performed two piano solos of their choice. Parents were obviously delighted as they kept the flashbulbs popping! This final recital was truly a public statement that learning brings with it a sense of joy rather than tension and struggle.

Although this study cannot be generalized for other populations or subject areas, the investigators encourage further research. These children not only demonstrated

superior achievement using relaxation and mental rehearsal techniques, but clearly exhibited delight and excitement throughout the learning process. It is this sense of joy and excitement that the authors wish to share with others.

* * * * *

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Die Auswirkung von Entspannung mit Hilfe von Musik und gesteigern Vortragsübungen auf den elementaren Klavierunterricht.

Zwei Lehremethoden zum Gruppen-Klavierunterricht wurden verglichen, um zu erstellen, welche Methode sich als erfolgreicher erwies. Großstadtkinder einer vierten Klasse Anfangstechniken des Klavierspielens zulehren. 24 umweltgeschädigte Schüler der 4. Klasse wurden von drei Volksschulen aus dem mittleren Westen ausgewählt und worden dann wahllos in zwei Gruppen von je 12 Schülern geteilt. Die erste Gruppe wurde musikunterstützter autogener Entspannung und geistigem Wiederholungstraining ausgesetzt. Die zweite Gruppe erhielt keine autogene Entspannung und geistiges Vortragsübungen. Die Schüler wurden wöchentlich und durch eine Endprüfung begutachtet. Am Ende der Untersuchung wurden die Schüler bei einem Vortrag innerhalb eines Konzertes von zwei Klavierlehrern, die sonst nicht an dem Projekt beteiligt waren, begutachtet. Die Resultate wurden an Hand eines "t-test's" für unabhängige Gruppen ausgewertet. Die durchschnittlichen Wertungspunkte der ersten Gruppe waren statistisch sehr viel höher, als die der zweiten Gruppe für die 1., 2., und 3. Woche, sowohl als auch was die Endprüfung anbetrifft. Diese Ergebnisse bestätigen die Hypothese, daß autogene Entspannung, durch Musik unterstützt, und gestiges Wiederholungstraining an Hand dieses Projektes, das Erlernen unterstützt und daß die umweltgeschädigten Kinder profitieren durch die Gelegenheit, eine lohnende Freizeitbeschäftigung erlernt zu haben, sowohl als auch durch die generelle kulturelle Bereicherung und ein erhöhtes Selbstwertgefühl.

L'Effet de la Relaxation Assistée par la Musique et de L'entrainement de la Révision Mentale sur l'Instruction Introductive du Piano.

Deux méthodes d'enseignement de l'instruction du piano en groupe ont été comparées pour déterminer la méthode la plus efficace pour enseigner les techniques élémentaires du piano à des enfants défavorisés sur le plan socio-économique du "fourth-grade" (CM-1). Vingt-quatre élèves du "fourth-grade" (CM-1) d'un environnement défavorisé ont été choisis parmi trois écoles urbaines élémentaires publiques du Midwest et ont été placés au hasard dans un de deux groupes, avec 12 élèves par groupe. Groupe 1 a reçu un entraînement dans la relaxation autogénérée assistée par la musique et dans la révision mentale; Groupe 2 n'a pas reçu d'entraînement pour la relaxation autogénérée ni pour la révision mentale. Les élèves ont été notés chaque semaine et sur un examen final de compétence en piano donné par les investigateurs. Comme examen final pour l'étude les étudiants ont été notés, par deux professeurs de piano de la région métropolitaine non-associés auparavant avec l'étude, sur leur performance lors d'un récital. Les données ont été analysées utilisant un "t-test" pour les groupes indépendants. Les notes moyennes du Groupe 1 étaient statistiquement d'une manière significative plus élevées que les notes moyennes du Groupe 2 pour les semaines une, deux, et trois et pour l'examen final de compétence en piano. Ces résultats ont démontré l'hypothèse que l'entraînement dans la relaxation assistée par la musique et dans la révision mentale améliore en effet l'acquisition. Au travers de ce projet, les enfants défavorisés sur le plan socio-économique et d'un environnement défavorisé ont bénéficié de cette occasion d'apprendre une compétence verbale pour un passe-temps, un enrichissement de leur culture générale, et un respect de soi plus élevé.

El Efecto de la Relajación a Través de la Música y la Preparación Mental Mediante la Instrucción Pianística.

Se compararon dos métodos de enseñanza pianística en la clase para determinar cual de ellos era más efectivo en el aprendizaje de las habilidades pianísticas introductorias en niños de cuarto grado habitantes del centro. Se seleccionaron a 24 estudiantes de cuarto grado de ambientes algo depravados pertenecientes a tres escuelas públicas de nivel elemental del medio oeste. Dichos alumnos fueron colocados al azar en uno de los dos grupos, 12 en cada uno. El primer grupo recibió relajación musico-autogénica y preparación mental. El segundo grupo no recibió ni relajación autogénica ni preparación mental. Los estudiantes fueron clasificados semanalmente mediante un examen final por los investigadores del tema. Como conclusión del estudio, se sometió a los alumnos a una actuación evaluada por dos profesores de piano que jamás habían estado asociados con dicho estudio. Los datos fueron analizados usando un "t-test" para grupos independientes. Los resultados del primer grupo fueron estadísticamente superiores a los del segundo durante las tres semanas al igual que en el examen final de piano. Estos resultados sostuvieron la hipótesis de que la relajación musico-autogénica y la preparación mental ayudaba a aumentar la adquisición a través de este proyecto, beneficiaba a los niños del centro pertenecientes a ambientes distintos y les daba la oportunidad de aprender algo para utilizar en su tiempo libre, además de enriquecer su nivel cultural y aumentar su propia estimación.

Metaphoric Teaching: The Use of Metaphor in Teaching Science and Literature*

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Abstract. An investigation of the literature of science (Newton, Boyle, Lichtenstein and Sagan) and literary criticism (Aristotle, I. A. Richards, Dewey and Coleridge) reveals the common use of metaphor as a generative device--a device used for the creation of what Stephen C. Pepper calls "world hypotheses." Metaphoric teaching makes use of the suggestive power of metaphor to bridge science and art, and to integrate affective and cognitive learning.

* * * * *

There are techniques that can help us name our dreams and dragons. They are designed to reopen the bridge between right and left to through traffic, to increase the left brain's awareness of the counterpart. Metaphor builds a bridge between the hemispheres, symbolically carrying knowledge from the mute right brain so that it may be recognized by the left as being like something already known.

*This article is a synthesis of James Quina's 1987 and 1988 SALT Conference presentations. An expanded version of this article appears as "Metaphor as Method," Chapter Twelve in James Quina's *Effective Secondary Teaching: Going Beyond the Bell Curve*, forthcoming, Harper & Row Publishers, 1989.

Marilyn Ferguson
The Aquarian Conspiracy

... part of the meaning of any experience is elusive, and it is the use of metaphor that formulates this elusive meaning and makes it available to us as an understandable figure of speech.

Ronald S. Valle and
Rolf von Eckartsberg
The Metaphors of Consciousness

When Carl Sagan was a boy he lived in the Bensonhurst section of Brooklyn, New York. Even at a young age he would look at the twinkling and remote stars and wonder what they were. When he asked adults what they were, they would reply--"They're lights in the sky, kid." Sagan says he could see they were "lights in the sky. But what were they? Just small hovering lamps? What for?"

As soon as his parents gave him his first library card, Sagan began reading about the stars. He discovered, he says, something astonishing: The book said something astonishing, a very big thought. It said that the stars were suns, only very far away. The sun was a star, but close up (Sagan, 1980).

These metaphors "the sun is a star; stars are suns" provided an opening--an intellectual awakening for Sagan. He reasoned that if the stars were suns, "they had to be very far away--farther than 85th street, farther away than Manhattan, farther away probably than New Jersey. The cosmos was much bigger than [he] had guessed."

Later [Sagan] read another astonishing fact. "The earth, which includes Brooklyn, is a planet and it goes

around the sun. There are other planets. They also go around the sun." (Sagan, 1980). But the sun is a star.

From this Sagan reasoned that the other stars must have planets too, ones we have not yet detected. "Some of those other planets should have life (Why not?) a kind of life probably different from life as we know it--Life in Brooklyn. "So I decided," says Sagan, "I would be an astronomer, learn a lot about the stars and planets and if I could, go and visit them." (Sagan, 1980).

Metaphor as a Way of Knowing

What, exactly, is metaphor and how can one learn through metaphor? The American Heritage Dictionary defines metaphor as "a figure of speech in which a term is transferred from the object it ordinarily designates to an object it may designate only by implicit comparison, or analogy ...". In the phrase "All flesh is grass," flesh is equated with grass, causing one to ask in what ways grass and flesh are related. It is the power to suggest possible relations between seemingly unrelated objects and concepts that makes metaphor useful as a learning instrument.

Sagan's discovering through metaphor is not unique among scientists. In his *Metaphorical Way of Learning and Knowing*, William Gordon outlines his system of Synectics, a system of using metaphor as a vehicle for problem solving, fictional character development, exploration of language, investigation of culture and personal insight.

Gordon uses metaphor to make the familiar strange and the strange familiar. For example, Gordon points out that William Harvey's discovery of blood circulation--from the heart to the lungs to the heart--to the arteries to the veins and then back to the heart--was

based on the use of a metaphor "The heart is a pump," which came to Harvey when he was observing a fish's heart which was still beating after the fish had been opened up." (Gordon, 1973).

Harvey's metaphorical interpretation of his observation of the fish's heart enabled him to recontextualize how he viewed circulation and break with the accepted sixteenth century interpretation--"that blood flowed from the heart to the body, surging in and out like tides of waves." Gordon described this function of metaphor "making the familiar strange." It is using metaphor to discover new possibilities, to innovate, to create.

Gordon goes on to say that for the novice the same metaphor may be used in a converse sense: "Making the strange familiar." Understanding a concept, Gordon says, requires bringing a strange concept into a familiar context. A professor of physiology may explain to a student that the heart acts like a pump and thereby remind the student of other connections:

The student may be reminded of a swimming pool where dirty water is pumped through the filter and back into the pool. The student, of course, makes the obvious connection between the heart and the pump. But he develops other connections as well. He sees how lungs and the liver act as "filter" when they cleanse the blood. Thus, through an example from his own experience, the student creatively contributes to his own learning. He makes the STRANGE FAMILIAR to himself by means of a highly personal connection process. (Gordon, 1973).

Basic Metaphors (Root Metaphors)

Basic metaphors, called "root metaphors" by Stephen Pepper (1970), are ways of organizing one's world. In *World Hypotheses*, Pepper says:

A man desiring to understand the world looks about for a clue to its comprehension. He pitches upon some area of common sense fact and tries [to see] if he cannot understand other areas in terms of this one. This original area becomes then his basic analogy or root metaphor. He describes as best he can the characteristics of this area, or if you will, discriminates its structure. A list of its structural characteristics becomes his basic concept of explanation and description. We call them a set of categories. In terms of these categories he proceeds to study all other areas of fact whether uncriticized or previously criticized. He undertakes to interpret all facts in terms of these categories. As a result of the impact of these facts upon his categories, he may qualify and readjust the categories, so that a set of categories commonly changes and develops. (Pepper, 1970).

Formism, Mechanism, Contextualism and Organicism

The four basic metaphors that Pepper identifies in Western thought are formism, mechanism, contextualism and organicism. The root metaphor of formism is similarity, of mechanism is the machine, of contextualism is the changing historical event, of organicism, integration or harmonious unity. Each root metaphor provides a different vision of the world. As I have said elsewhere (Quina, 1982):

To see the world formistically is to see the world in terms of similarity--the similarity of

trees, the similarity of rectangles, the similarity of poems and of human types, the similarity of botanical specimens (see fig. 1). It is to see the world in terms of identity and difference, as type and subtype, class and subclass. Mathematical, logical, and aesthetic forms lift off the face of the world as essential realities. There are two days, two fish, two persons, two songs--there are two.... To see the world mechanistically is to envision space, time, action and reaction, stimulus and response, to see quantities emerge, to ask the questions when, where, how much, how often; it is to see the world as a machine (see fig. 2). To see the world contextually is to see it as a series of experiential moments, always coming to completion, only to begin again, opening into new textures, becoming new strands of experience. It is to see the world as a continual unfolding of experience, an encountering of new streams of experiencing and re-experiencing, of interpreting and reinterpreting (see fig. 3). To see the world organically is to see it as integrated organism, as completed puzzle. It is to see that all the pieces in the puzzle must fit or else find a larger whole. All things are related, all things are integrated: poems are integrated, suns and moons are integrated, bodies are integrated, tapestries are finished and perfect. To see in this way is to see the whole in relation to its parts (see fig. 4). (Quina, 1982).

From these initial visions one proceeds to organize the world. One can organize and comprehend any subject astronomy, art, poetry, music, sculpture and drama. Let's explore two broad instructional uses of root metaphor: the study of science and the study of literature.

Fig. 1 - Formism

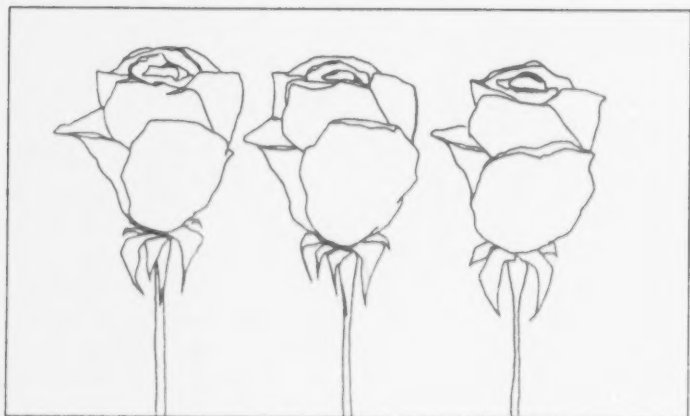


Fig. 2 - Mechanism

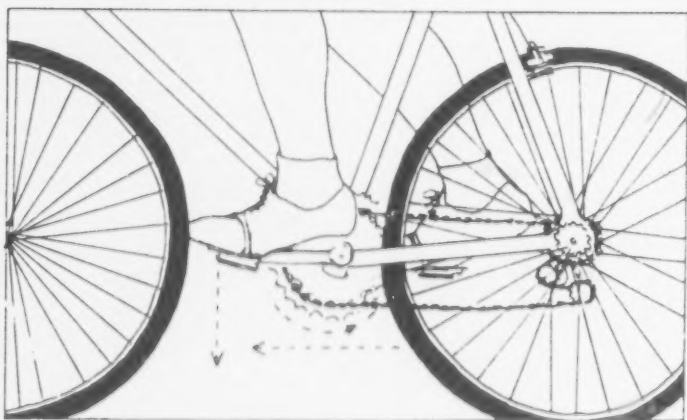
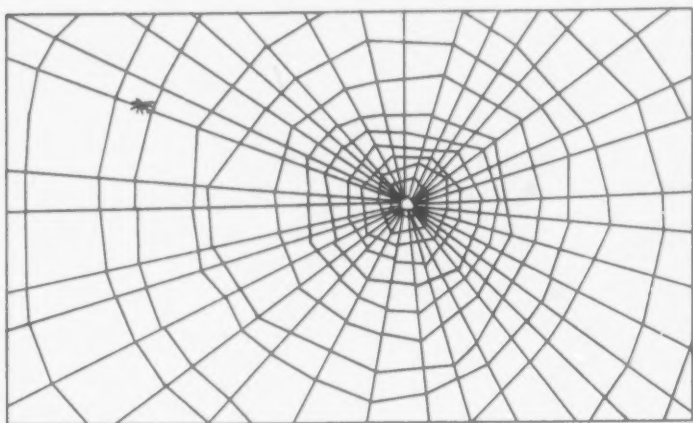


Fig 3 - Contextualism



Fig. 4 - Organicism



Root Metaphors in Science

In the literature of scientific investigations, root metaphors can be identified. These root metaphors shape the direction of scientific inquiry.

Formism in Science (The World as Similarity)

Georg Lichtenberg (Peterson, 1982), who discovered the shape dust took on a dielectric plate after it was charged, described the phenomenon in terms of correspondence between the configuration of the dust and other aspects of nature: "like small stars at certain points," he said. Intentionally, he sprinkled more dust on the plate and the stars became the "Milky Way and bigger suns." Again he said, they were like "crystals on a frozen window pane." (Peterson, 1982).

The power of formistic metaphor is the discovery of similarity in seemingly dissimilar things. As Bronowski puts it: "The apple in the summer garden and the grave moon overhead ... are surely as unlike in their movements as two things can be. [Yet] Newton traced in them two expressions of a single concept--gravitation," (Bronowski, 1965). Whitehead sees awareness of similarity as the basis of mathematical creation. "The first man," he says, "who noted the analogy between a group of seven fishes and a group of seven days made a notable advance in the history of thought," (Whitehead, 1975).

Mechanism in Science (The World as Machine)

Archimedes, in describing the principles of the lever, said, "Give me a place to stand, and I will move the earth," and Boyle, in exploring air pressure, thought that air under pressure must act like a number of coiled springs (Seidel, 1958). Boyle's contemporaries tried to counter him by arguing that if air had springs in it, one would feel them on one's skin. Here we see an

instance of confusion arising from taking the metaphor too literally. Nevertheless, by adopting a mechanistic view of phenomena, both Archimedes and Boyle were able to explain many other related phenomena. The image of the universe as a machine was common to both.

Contextualism in Science (The World as Historical Moment)

The literature of scientific discovery is filled with contextual images--images of the scientist as a purposive agent--experimental, pragmatic, goal seeking. "Those sciences are vain," says Leonardo da Vinci, "which are not born of experience." "Invention" says Benjamin Thompson (Count Rumford) seems to be peculiarly the province of the man of science . . . discovery his harvest, utility his reward," (Seidel, 1968). The attitude of insistence that nature yield a harvest is perhaps best explained by Edison. What he said was, "There's a better way to do it..Find it." What he did was more astonishing. In pursuit of a breakthrough of the electric light bulb he accumulated 9,999 failures--each a potential breakthrough. Experiment 10,000 yielded the electric light.

Organicism in Science (The World as Integrated Whole)

A final metaphor--organicism takes a highly visual form in the work of the German chemist, Kekule, who not only postulated the theory of the carbon ring, but the concept of the double bond. Encouraged by his father to become an architect, Kekule instead applied his ability in spatial visualization to the three-dimensional structures of theoretical chemistry. He found the structure of benzene in 1866 and on the twenty fifth anniversary of his discovery he described the experience of his discovery which originated in a dream (Gould, 1966):

The atoms were gamboling before my eyes. I saw how frequently two smaller atoms united to form a pair, how a larger one embraced the smaller ones; how still larger ones kept hold of three or four of the smaller, whilst the whole kept whirling in a giddy dance

and later,

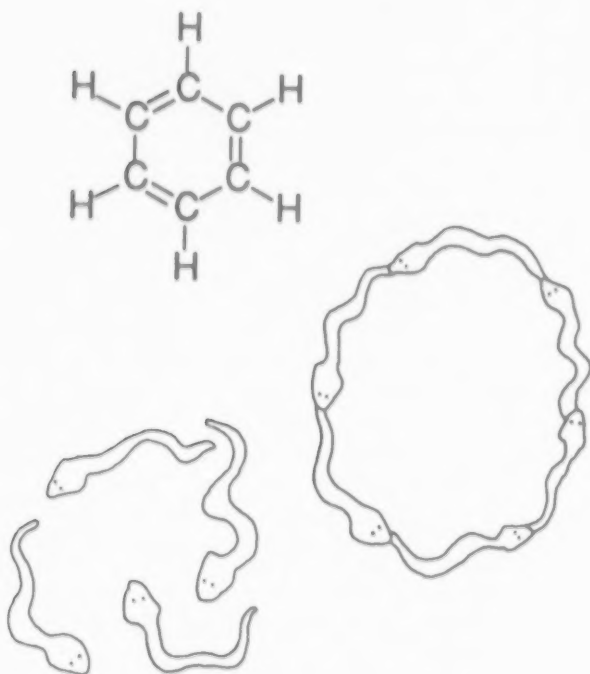
Again the atoms were gamboling before my eyes...My mental eye rendered more acute by repeated vision of this kind, could now distinguish larger structures manifold conformation; long rows, sometimes more closely fitting together, all turning and twisting in snake-like motion. But look! What was that? One of the snakes had seized hold of his own tail, and the form whirled mockingly before my eyes (Gould, 1966).

Kekule had immersed himself in a search for the structure of benzene. He knew the molecular formula of benzene was C_6H_6 , but the valences didn't make sense in terms of a structural formula he could imagine. Carbon has a valence of four, hydrogen a valence of one. Any linear structure he could imagine would leave free radicals - an impossible situation given the chemical behavior of benzene. How, then, were the atoms integrated? How did they fit together?

The vision of the atoms linking together and turning into a serpent which bites its own tail gave Kekule a spatial metaphor which resulted in a powerful paradigm shift in the history of theoretical chemistry. Atoms did not have to be arranged in linear structure; they could

be integrated as a ring structure. Hence the formula for benzene (see Fig. 5). From here it was only necessary to postulate alternating double and single bonds to satisfy the valence of carbon and hydrogen.

Fig. 5 - Kekule and structure of benzene



We have here a perfect organic metaphor suggesting integration of fragments. As we translate the spatial metaphor of the swirling serpents into intellectual terms, we are driven toward unity--all the parts of the struc-

ture must fit and there must be no unnecessary parts. Everything is integrated. The coherence revealed in the dream is a kind of truth. Listen to Kekule: "Let us dream, gentlemen, and perhaps we shall know the truth." This was Kekule's recommendation to his colleagues at the twenty-fifth anniversary of his discovery. Another way we can translate his statement is that we investigate nature via hypotheses, but what about the generation of hypotheses themselves? For Kekule, the dream was a bridge--a viable method of creation. Can we, then, take a cue from Kekule and teach students metaphoric creation via the dream?

You can, for example, have your students identify the use of the root metaphors in descriptions of other scientific discoveries. Which metaphors tend to dominate these descriptions? How many things can you say about a tree? Brainstorm this question. Write down everything you can think of, then go back and see if you can discover which root metaphors you were using all along. Try the same exercise using a cake. How many things can you say about a cake? How many things can you do with a cake? In the process of exploring these probes you may discover many things about your own thinking, your own way of seeing the world.

One student, for example, created a poem as she worked with the cake exercise:

CREATING
by Mary Banish

She's baking a cake.
Eggs and flour meet
in the bowl.
All of the ingredients
have been added.

She folds them in.
With a slow, sure movement,
she pours the mixture
into clean, white pans.
Confidently, she places them
into the oven, and waits
for a change.
Her eyes catch the spoon
and hold it
until the spoon becomes
a thick-petaled rose,
deep gold with a
deeper gold reverse,
just beginning to open.
The image freezes
at this stage,
and the room is filled
with a rich, heavy fragrance.
She feels it's time.
Carefully, she takes them
from the oven
and places them on the sill.
She lets them cool.
Beyond the sill,
a garden emerges--
a blend of colors
and textures.
When she knows
she has waited long enough,
she gently lifts the layers
from the pans
and joins them.
She will frost them now,
Smoothing over the cracks.
She stands back--
It is just a cake.

Root Metaphors in Literature

In traditional Western literary criticism, root metaphors can be identified which shape the direction of critical inquiry.

Formism in Literature (The World as Similarity)

In literature formism shows up as classification. There are similar characteristics for each literary period--Medieval, Renaissance, Neo-Classical, Romantic; there are similarities of type character and definitive ways of classifying literary works as genre--the novel, the poem, the essay. Moreover, the structure of literature can be taught through the metaphor of similarity. For example, Herman Hess's *Narcissus* and Goldman can be taught as an exploration of ideal types. Narcissus is representative of the Appolonian rational being; Goldman, the Dionysian, artistic being. Exploration of character in Lloyd Alexander's *Chronicles of Prydain* can serve as a rich background for a later study of the same generic types in Tolkien's stories and on a more advanced level, in the study of character in Chaucer's and Mallory's works. In writing the *Chronicles of Prydain*, Lloyd Alexander says he dipped into the same vat for his characters as that used by Tolkien, Mallory and Chaucer.

Mechanism in Literature (The World as Machine).

The vision of the universe as cause and effect, as stimulus and response can be suggested through images of a hammer striking a nail (Figure 5), a series of pendulum balls striking one another or a simple see-saw. Let's consider how stimulus and response can operate in a poem. As you read through John Tobias' "Reflections on a Gift of Watermelon Pickle," write down your exact experiences of the poem--any emotions, memories, thoughts, associations, notations of patterns, pleasurable and unpleasurable responses. Here is the poem:

During that summer

When unicorns were still possible;
When the purpose of knees
Was to be skinned;
When shiny horse chestnuts

(Hollowed out
Fitted with straws
Crammed with tobacco
Stolen from butts
In family ash trays)

Were puffed in green lizard silence
While straddling thick branches
Far above and away
From the suffering effects
of Civilization.

During that summer--
Which may never have been at all;
But which has become more real
Than the one that was--
Watermelons ruled.

Thick pink imperial slices
Melting frigidly on sun-parched tongues
Dribbling from chins;
Leaving the best part,
The black bullet seeds,
To be spit out in rapid fire
Against the wall
Against the wind
Against each other
(Tobias, 1961).

Review what you have written down, the sensations, emotions, associations, etc. Now circle those specific lines of the poem that you think caused those sensa-

tions, emotions, associations. When complete, you will have performed a mechanistic analysis of this poem. You will have hypothesized cause and effect (stimulus and response) relationships between the poem and your aesthetic response to it.

Contextualization in Literature (The World as Historical Moment)

Contextualism is suggested by the visual metaphor of multiple faces, representing multiple viewpoints and change of perspective. There are other physical representations of change. For example, in Hawthorne's "Dr. Heidegger's Experiment," the doctor reverses the aging process to determine if and how one learns from experience. In teaching this story contextualistically, one Detroit teacher makes use of a number of props: A metronome, a burning candle, an hourglass, a diary, a boyhood baseball cap, a human skull, a ball of string. As he unwinds the string he talks about his childhood and the process of growing older. Each prop is used as a physical analogy suggesting the passing of time. The students' personal reactions to the props are connected with parallel metaphors of change in the story.

Organicism in Literature (The World as Integrated Whole)

Organicism is visually represented by the web. Other graphic representations are the jigsaw puzzle, the garden, the molecular model and the universe as planetary relationships. On the human plane, the idea of personal relationships can be suggested through these images and others.

One teacher uses singing in rounds to imbed the idea of human relationships. He shows up attired in cap, camp shirt, shorts, backpack, and whistle. He leisurely describes the joys of going camping as he simu-

lates building a fire. (He actually does burn pine resin, creating the olfactory suggestion of being there.) Then he leads the class in singing rounds of camp songs. Relationships between various singing groups are underscored while he proceeds to comment on the good story he is reading. The story he is reading on the camping trip--yes, you guessed it--is *Bless the Beasts and Children* (Jerome Dishman, 1987).

Before the mood of playing and surprise has subsided, the teacher swiftly draws out the analogy of the round (e.g., "Isn't it amazing how humans are able to integrate harmony, melody, rhythm and inflection at the drop of a hat?") The teacher next moves the focus toward the center of the room by turning on a lantern or flashlight in the center of the room (where the other physical objects and pine cone embers have been located) while continuing to speak: "Humans are capable of doing that. Especially on an adventure, an expedition, a quest, a mission. Like Bilbo Baggins the Hobbit, or Odysseus on his voyage, or Huckleberry Finn and Jim (or other adventurers familiar to the students). And especially at night." Here the teacher shuts out the overhead lights, so the center of light moves to the lantern. The teacher then moves toward the tape recorders, one which has a tape of waves sounds, the other a tape of some acoustic guitar music, suggesting: "Especially in the moonlight, near the ocean, or near a lake or a river, or in the woods, in a forest, on a country road, (etc.) or maybe in a cabin." (Dishman, 1987, p. 25).

Teaching Root Metaphor Suggestopedically

Root metaphor can be introduced to students through a delightful fantasy. Analysis of the concepts can be introduced after the students have imaginatively processed these metaphors. The following guided fantasy is best presented as a reading with music, using either Romantic or Classical music. This type of music will enhance the fantasy.

The Story of the Great Rock

Long, long ago there lived a tribe of people called the Old Ones. They lived in a remote village settled high in the mountains of a far away land. It was said they could trace their ancestry back to the very beginning of civilized thought. The Old Ones prided themselves on their knowledge of the world. They knew they were different from the nomadic tribes that roamed the valleys and they knew they were always the same Old Ones--members of the same family of people.

The Old Ones believed that the way to know the world and the things in it was very simply to find out what a thing is. One did this by comparing things. Some things were similar, some dissimilar. They knew the animals and birds by their shape and form and they classified animals, plants and rocks. The world had order and everything had its place. They knew good plants from poisonous ones by the design of their leaves and they knew the stars by the patterns of light they made in the night sky. There was order in the world and there was a right way of acting--a way which corresponded to the normal ways of the Old Ones.

The Old Ones did not travel very much. It is said they were the first to organize libraries and museums. Here they spent most of their time classifying knowledge. One spring, however, they traveled west to a part of the mountain they had never seen. Here they discovered something they could hardly believe they were seeing. A gigantic rock of a different shape and texture from the mountain rock was embedded in the side of the mountain. "What is it?" they asked, and they began to compare it with things they already knew about. Its size was larger than their libraries and museums put together. Its surface was not like any material they had known, and its placement on the side of the mountain seemed strange to them. Rocks as they knew them did not have this pattern.

Many hundreds of years passed when a new group of travelers discovered the Great Rock. They came down from the northern mountains, carrying with them instruments for measuring the world. They came to be known as the Nordic Conquerors, or more commonly as the Hammerheads. Out of the materials of the earth they fashioned instruments for measuring things. They measured the weight and shape of rocks and trees and the distances between things.

When the Hammerheads first saw the Great Rock they asked--"What caused this? How did this happen?" They were an energetic tribe and they set about discovering the cause of the Great Rock.

By day they worked long and hard. In the evening they built immense fires and stimulated themselves with lively conversation, good food and drink, and tales of valor--tales about their conquest of nature and of nomadic tribes.

Then from the South the Surfers came. They came on ships crafted for discovering new lands, new treasure, new adventures. They loved surfing over the waves and exploring the sheer novelty of unexplored territory, of seeing new landscapes, new reflections of sun and moon. They were eager to learn new languages, to experience unusual foods, to experiment with novel ways of dressing--even if occasionally it meant being uncomfortable.

The Surfers wanted to see the world through many eyes, to explore many directions and find practical outcomes. When they first discovered the Great Rock they exclaimed: "What can be done with this? What are the possibilities?" So they set about fashioning an entertainment center out of the area. They sculpted the land to make paths leading to the Great Rock even more interesting to the eye. Eventually they charged a fee for other groups (the Old Ones and the Hammerheads) to walk their sculpted paths. And for this fee these groups could find a prime spot to do what they thought important. The Old Ones continued to properly classify the Great Rock and the Hammerheads continued to explore the cause of the Great Rock--and to dance and sing long into the night. After many years the Surfers were besieged by yet another tribe--a fourth tribe which came out of the East. The new group called themselves the Round Ones, but came to be known as the Wise-Webbed ones.

The Wise-Webbed ones thought that all things had to be connected like the connections in a Great Web--and complete like a circle. Everything was related--the plants and the earth, the moon and the tides, the azure sky and the eyes that beheld it.

To the Wise-Webbed ones the Great Rock was a natural part of the universe. It was silly to look for one cause of the Great Rock as the Hammerheads had done. There were many relationships that could be discovered. When you discovered those then you would have knowledge. You could then answer the question: How are things related? How are things integrated? This was like asking why are things the way they are? It was like gazing upon raindrops on flower petals and knowing that everything was appropriate if only one could apprehend all the connections.

The Wise-Webbed ones did not make very good customers for the Surfers. Though they were interested in the Great Rock, they were equally interested in all of nature, including the behavior of the Surfers whom they constantly studied--along with their study of the Hammerheads and the Old Ones--along with their study of color patterns of rainbows and the texture of linnet wings.

Which tribe do you like and why? How would each tribe approach a study of science, literature, art, commerce? What are the basic assumptions of each tribe? How would each group differ in their approach to morality and ethics? Cite evidence from the fantasy to support your views.

Rational Extensions of Root Metaphors: World Hypotheses

Each root metaphor generates a set of categories that form a hypothesis about how the world is constructed. Pepper calls these world hypotheses. They are unrestricted in scope, i.e., not tied to one field such as physics or psychology, and they are rigorous, that is, they have explanatory power. Let us turn now to an

example of that explanatory power--an application of the four root metaphors as a critical method. In the following section Elizabeth Blaszcak, a suburban high school English teacher, shows how formism, mechanism, contextualism and organism can be applied to a study of John Knowles's, *A Separate Peace*. (Blaszcack, 1982).

A Suggestopedic Approach to *A Separate Peace*

Aims

1. An understanding of character motivation, specifically Gene.
2. Through this understanding a realization of theme.
3. To teach this (a) through experience with direct descriptive passages, the use of action, and dialogue; and (b) the employment of the world hypotheses used serially.
4. An understanding of the belief that one needs to have experienced a feeling to be able to truly grasp its meaning for another.

A Fantasy Script

1. Sit comfortably
2. Close your eyes
3. Take a good, deep breath
4. Let your mind and body relax.
5. Let go of any tension

I want you to think about friendship. What do you look for in a friend? What do you think is *important* for a good *friendship*? Could you think of one characteristic which is more important to you than any others, possibly loyalty or sincerity? Is there one friend in particular that you now feel very close to or did in the past; a friend whom you've known for many years or one who has just recently become your friend; a friend

whom you can trust or depend on. Picture that friend in your mind. Keeping that picture in front of you, answer as honestly as you can the following questions: How would you describe your friend? What adjectives would you use? Do you have a trusting relationship with this friend? Would you do almost anything for your friend if he were in trouble? Have you ever had a fight with this friend? Or maybe you made some *critical remarks* which hurt you both. Did your relationship suffer because of this? Afterward, were you ever able to feel the same about your friend? Have you ever felt that your friend was lying to you? Have you ever lied to your friend? Why? Was there an occasion when you felt jealous of your friend; possibly because of your friend's new house, car, good looks, money, good grades? Did you ever wish you were more like your friend? Did you ever feel any rivalry with your friend? Did you ever compete with your friend? How did you feel about the competition? Were there any feelings which you tried to hide from your friend or even from yourself? Have you ever felt guilty because you thought or said something bad about your friend, possibly some gossip you should not have repeated? Did these feelings ever depress you? Did these feelings affect your relationship? How? If there was one thing you could do to improve your friendship, what would it be?

Allow the picture of your friend to fade. You are alone with your thoughts. Your mind begins to wander; you find yourself in a boy's room, allow yourself to enter the boy's mind. It is a *tormented mind*. You become one with the boy named "Gene." (At the discretion of the teacher, passages from the novel, *The Separate Peace*, may now be read. This will build a strong connection between Gene's thinking in the novel and the fantasy. Suggested passages from *The Sepa-*

rate Peace, Bantam Edition, 1979 edition are on pp. 44, 45 and 46.)

The room fades, and you find yourself standing on the high limb of a tree holding tightly to the trunk. Your mind reels with fear but it is not because of the height. It is because your understanding of yourself is menaced. (At the teacher's discretion, another passage from *The Separate Peace* may be read at this point. A suggested passage is on p. 5 of the 1979 Bantam edition.)

You take a step toward your friend, then your knees bend, you jounce the limb. Finny (your friend) tumbles sideways and hits the bank below with a sickening, unnatural thud. You move out on the limb and jump into the river, every trace of your fear of this forgotten.

Breathe a sigh of relief. Allow all your images to fade. Gradually "return" to the classroom. Slowly open your eyes.

The students are now led through an examination of the novel based on the four world hypotheses. These approaches will be used serially, beginning with formism, mechanism, then contextualism, and finally organicism.

Formism

1. Compare the differences in character of Finny and Gene. List similarities and differences in their reactions to the first experience jumping from the tree. Refer to differences in attitude toward war, friendship, and school.
2. Note the differences in how Gene, Finny, and Leper attempt to cope with reality (evil in world and man).
3. Read "Young Goodman Brown" by Nathaniel Hawthorne (a story about the inability of a man to recognize evil in the world); and read the poem "Out,

Out" by Frost (a poem about a boy who refuses to live with the reality of a lost hand). Compare the similarities and differences of themes with *A Separate Peace*.

Mechanism

1. How did you feel when Gene jounced the limb?
2. Was your feeling intense? Of what duration?
3. Why did you feel that way?
4. What in the text (selections from that particular chapter) caused you to feel that way? Refer to specific passages.
5. Identify any appeals to the senses which had a recurring pattern. Were these pleasurable or not?
6. Write a passage of description (employing the five senses) which reveals your feelings at that time.

Contextualism

1. How does your perception of Gene change as he is described in different contexts? Refer to the following chapters or scenes:

- Chap. I - The adolescent Gene describes the Tree.
- Chap. II - Gene is saved from falling when Finny steadies him.
- Chap. III - As they fall asleep on the beach, Finny reveals that Gene is his "best pal" but Gene does not reply in kind, although he starts to do so.
- Chap. IV - Gene decides that Finny has been purposely drawing him away from studies to keep him from being valedictorian.
- Chap. V - Gene tells Finny the cause of the accident, but Finny refuses to believe him.

- Chap. VI - Gene reveals that he wants to "become a part of Phineas."
- Chap. VIII - Gene discovers Finny's need for him; and his attitude toward the war changes.
- Chap. XII - Gene compares his action and the result to the many acts of hate and their more horrible results in the war.
- Chap. XIII - The adult Gene explains the change which Finny's death caused in him.

2. Using your series of perceptions into Gene's character, answer the following questions:

- (a) If Gene realizes that the jealousy, selfishness, and rivalry exist only in himself (Finny has revealed that he believed Gene excelled in class as effortlessly as he, Finny, excelled in sports) then why does he jounce the limb?
- (b) Immediately after Finny falls, Gene jumps with " . . . every trace of his fear of this forgotten." Why is his fear gone?
- (c) The fall is the turning point in the novel because it introduces Gene to a new problem. What is it?
- (d) ".....there was always something deadly lurking in anything I wanted, anything I loved. And if it wasn't there, as for example with Phineas, then I put it there myself."
 "..... it was this liberation we had torn from the grey encroachments if 1943, the escape we had concocted, this afternoon of momentary, illusory special and separate peace." Using the above quotes, answer the following questions:
 - (a) How does Leper escape from reality (the brutality of war?

- (b) Finny (who refused to accept the reality of evil) must finally confront it. What is his only escape?
- (c) Why does only Gene survive?
3. How does your perception of Gene, and Gene's perception of himself change due to different contexts of time? Refer to the following quotes:
- "..... wars were not made by generations and their special stupidities, but that wars were made instead by something ignorant in the human heart."
- "Phineas alone had escaped this. He possessed an extra vigor, a heightened confidence in himself, a serene capacity for affection which saved him. Nothing . . . even about the war had broken his harmonious and natural unity. So at last I had."
- "Because my war ended before I ever put on a uniform; I was on active duty all my time in school; I killed my enemy there."

Organicism

The interrelation of setting (including not only places but also times, societies, and individuals), with character, plot, and theme has combined to make *A Separate Peace* a unique experience. The result is a complete integration of feeling. In order to examine how each aspect reinforces and complements the other, and contributes to the final aesthetic experience, have students work with the following questions and activities:

1. How would you characterize Devon? In what kind of setting is it shown to exist? What changes has the war brought about in the school and its life? Is the nature of Devon important to the story?

2. What part does the war play in the story? How do the students feel about the war? Why?
3. If a war had not been going on, how might the story have been different? Does the war influence the action? The students' feelings? Their relations to each other?
4. Why does Gene spend so much time describing the places and people around him? Do his descriptions add to the book? How?
5. Gene sees a great change in Devon from the summer to the fall and winter. What seems to be the cause of this change? Do the seasons seem to affect the students' moods and feelings?
6. Read aloud the concluding passage of the book and discuss with the class the effect which the setting played in causing the events of the story and the effect which they and Finny had on Gene.
7. How much of Gene's idealized view of Finny was a result of the setting in which he knew him, that is, the war, the school, etc.?

Critical Pluralism

The pluralistic approach outlined here has implications for curriculum building, and methods of teaching. Pepper's four world views provide a basis for both individualizing and expanding learning experiences. Use of categories of formism and mechanism gives the student practice in applying quantitative evidence; use of the categories of contextualism and organicism gives the student practice in applying qualitative evidence. In *The Educational Imagination* Elliot Eisner has argued that if we are to move beyond the present truncated curriculum of most high schools, we must teach students to

use both quantitative and qualitative evidence, to approach art and science with rigorous tools of inquiry. (Eisner, 1979). In *Experiential Learning* David Kolb has shown how Pepper's system can be used to support multiple learning styles. (See Appendix.) To Kolb, these basic learning choices have implications not only for academic mastery but for career choices as well. Ideally, all students will gain facility in all learning styles even though one style will probably remain dominant for each individual. His chart at the end of the article provides a basis for planning lessons in the sciences and the humanities. By using this chart the teacher can build into her lessons key words and phrases derived from each world hypothesis. This approach to metaphoric teaching meets the needs of a variety of learning style preferences, provides optional ways of processing science and literature and allows one to explore relationships between disciplines. See, for example, the article in your bibliography by Arthur N. Geddis, "Teaching: A Study in Evidence," in which Geddis tells how to teach high school physics in terms of Pepper's four world hypotheses. The same methods and the same modes of evidence that Geddis uses to teach physics can be used to teach high school literature, pointing to vital commonalities between science and literature. Metaphoric teaching is truly interdisciplinary.

Ernest Boyer (1983), president of the Carnegie Foundation for the Advancement of Teaching, has said in his book *High School* that in addition to tightening requirements [for high school], we must bring a new interdisciplinary vision into the classroom and the total program of the school . . . the content of the core curriculum must extend beyond the specialties to touch larger, more transcendent issues.

Teachers must play a key role in making these connections between disciplines. They must view the curriculum in a more coherent way

Perhaps no disciplines are inherently incompatible. Compatibility may be a matter of locating useful metaphors to build bridges between disciplines.

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Methaphorisches Lehren: Der Gebrauch von Methaphor beim Lehren von Wissenschaft und Literatur.

Eine Untersuchung der Literatur der Wissenschaft (Newton, Boyle, Lichtenstein und Sagan) und literarischer Kritik (Aristoteles, I. A. Richards, Dewey und Coleridge) zeigt den gewöhnlichen Gebrauch von bildlichem Ausdruck als generativen Apparat, ein Gerät, daß zur Schöpfung von was Stephen C. Pepper "Welthypothese" nennt, benutzt wird. Methaphorisches Lehren gebraucht die suggestive Macht von Methaphorn, um Wissenschaft und Kunst zu überbrücken und um affektives und cognitives Lernen zu integrieren.

L'Enseignement Métaphorique: l'utilisation de la Méta-phore dans l'Enseignement de la Science et de la Littérature.

Une investigation de la littérature sur la science (Newton, Boyle, Liechtenstein et Sagan) et la critique littéraire (Aristote, I. A. Richards, Dewey et Colerige) révèle l'usage courant moyen pour la création de ce que Stephen C. Pepper appelle "hypothèses mondiales." L'enseignement métaphorique utilise la force suggestive de la science et

APPENDIX TABLE 1. ROOT METAPHOR IN LITERATURE AND SCIENCE

	FORMISM	MECHANISM	CONTEXTUALISM	ORGANICISM
Root Metaphor	Similarity	Machine	Changing/Historical Event/Experiential Moment	Integration (Harmonious Only)
Theories of Truth	Correspondence (Absolute)	Causal- adjustment (Relativistic)	Instrumental Pragmatic (Relativistic)	Coherence (Absolute)
Key Words	definition characteristics form plan classification ideal form participation norms standards normal comparison contract pattern	cause effect primary qualities secondary qualities measurement quantity location physical laws spatio-temporal association	quality purpose goal flux change point of view strands texture multiple realities conflict arbitrary presence (now)	relationship growth ideal inte- gration cumulative truth nexus fragments unity wholistic organism appearance/ reality
Literary Manifestation	standards/norms, genre character types	determinism in character moti- vation	funded experience points of view conflict	"reconciliation of opposites and discordant

	literary period styles of writing	emotive & sensory response (cause & effect) in literary criticism	aesthetic quality purposive action	qualities every image & concept supports every other image & concept
Standard of Literary Judgment	Conformity to a standard or norm, e.g., conformity to the requirements of an Elizabethan sonnet	Productive of the pleasures of sensory and emotive response; the pleasures of association	Rich in strands of experience; intense experience of quality	Appropriateness; fitting all parts to create a unified whole; organic unity
Scientific Metaphors as First Metaphors	Galen: "A physician needs to study anatomy as an architect needs to follow a plan." Newton: Noting the similarity between the falling of an apple and the orbiting of the moon suggested law of gravitation.	Archimedes: "Give me a place to stand and I will move the earth." Boyle: The rise of mercury in a column is caused by "the spring in the air."	Leonardo da Vinci: "Those sciences are vain...which are not born of experience." Thomas Edison: "There's a better way to do it. Find it." Benjamin Thompson: Invention seems to be peculiarly the province of the many sciences... discovery his harvest; utility his reward.	Kekule: (See Fig. 5)

l'art et pour faire un pont entre intégrer l'instruction affective et cognitive.

Enseñanza metafórica: El Uso de la Metáfora en la Enseñanza Científica y Literaria.

Una investigación realizada sobre la literatura científica (Newton, Boyle, Lichtenstein y Sagan) y la crítica literaria (Aristotle, I. A. Richards, Dewey y Coleridge) revela el uso común de la metáfora como una herramienta generativa--una herramienta utilizada para la creación de lo que Stephen C. Pepper llama "hipotesis mundial." La enseñanza metafórica utiliza el poder sugestivo de la metáfora para conectar la ciencia y el arte, y para integrar el aprendizaje afectivo y cognitivo.

Erratum

There were several errors in the tables in Lyelle Palmer's article in *JSALT*, 1985, 10(2). Please paste these entire pages over the original pp. 113 and 118-119.

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The Editor welcomes submission of manuscripts with a focus on accelerating and improving teaching and learning, particularly with classroom suggestion or Suggestopedia. This journal publishes articles on: critical reviews, theoretical analyses, speculative papers, case studies, quasi-experimental studies, as well as reports of controlled studies of empirical research.

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The Use of Suggestopedia with Limited English Speaking Hispanic Elementary Students

Yolanda Garcia

Abstract. A Suggestopedic-like approach was utilized within a classroom setting to determine if it might provide a significant effect on the learning efficiency in the English language of Hispanic elementary school students identified as having limited English speaking abilities. This study is divided into two separate phases. In Phase I, the empirical study, the results of the Gates-MacGinitie Vocabulary Posttest were significant at the $p < .05$ and the Comprehension Test were significant at the 0.001. Phase II, ethnographic, examined the student's individual learning strategies to determine if certain individual strategies constitute a more effective Suggestopedic student. The Suggestopedic-like approach appeared to facilitate learning strategy development.

* * * * *

Purpose of the Study

The purpose of this study was to implement Suggestopedic techniques in a classroom setting to determine if it might provide a significant improvement in learning efficiency in the English language by Hispanic elementary school students, in particular, Hispanic students who have been identified by the public school system as having limited English speaking abilities.

After the Suggestopedic classroom training was done, comparison of the most improved and the least improved students on the posttest was done to determine if there were any salient individual learning characteristics which would correlate with their gains.

Because Lozanov's original research on foreign language learning was conducted in Bulgaria where foreign language classes were a result of expansion in research, this methodology has not been sufficiently researched in an American classroom setting. Further, research is necessary to determine the effectiveness and practicality of Suggestopedia within a classroom setting as well as consideration of the individual's learning characteristics to determine if certain individual characteristics constitute a more effective Suggestopedic student learner.

Introduction

In order to study the effectiveness of Suggestopedia in a public school setting, a public school system was sought for implementation of this study. Several attempts to gain access to a school system were unsuccessful, given the experimental nature of the study; therefore, an alternate setting comparable to a public classroom was selected. The site of this study was the Ripley House Community Center, where special English language tutorial classes are held.

The Ripley House Community Center is located in the "barrio" on the South East side of Houston. In September 1983, a tutorial, counseling and recreational program was developed at this center to address the needs of neighborhood children enrolled in the Houston Independent School District.

Research questions

The effectiveness of Suggestopedia as well as its feasibility in a school setting was to be studied along with the individual learning characteristics of students. The following research questions were investigated:

1. Do the experimental (Suggestopedic) students employ learning characteristics or strategies which result in high scores on the posttest?
2. Do the experimental students, when interviewed, evaluate Suggestopedia as helpful in learning?
3. Do the experimental teachers evaluate Suggestopedia as being helpful in teaching?
4. Do the experimental teachers find the groups receptive to the Suggestopedic method?

Hypotheses

The following null hypotheses were proposed for this study:

1. There will be no significant, positive difference in second language acquisition between a control group traditionally taught and an experimental group exposed to Suggestopedia for one 60-minute period daily for a period of two weeks.
2. There will be no difference in individual learning characteristics between the students exposed to Suggestopedia who scored high on the posttest and the students who scored low on the same posttest.

Design

This study had a two-fold design. The first part of the study consisted of training the teachers to implement the Suggestopedic method to an experimental group with the empirical testing of the hypotheses and the rejection of the null hypotheses. Secondly, students were selected according to the amounts of points gained on the posttest from both the experimental and control groups for interviewing in an attempt to determine if the learning characteristics or strategies employed by the students had a relationship to the points gained on the posttest.

Two experimental treatment groups and two control groups comprised the subjects for this study. All the subjects were randomly assigned to each group from a list prepared by the center. The first seven subjects were assigned to the Control I group, the second seven subjects were assigned to the Control II group, the next eight subjects were assigned to the Experimental I group and the last seven subjects were assigned to the Experimental II group, totalling 29 subjects.

The subjects were pretested the day prior to the initiation of the study. The four participating teachers administered the pretest to the participating subjects.

Four teachers employed by the center were the instructors in this study. Two teachers volunteered to teach the control group and two chose to teach the experimental group. The training of the experimental teachers was done by the researcher a week prior to actual implementation of the study.

The experimental groups were taught in a Suggestopedic manner, while the control groups were taught in

a traditional fashion. Traditional refers to the methods and approaches most often used in academic situations, adherence to the teacher's manual for direction, style and activities. All four groups met for 60 minutes per day for a period of two weeks according to the tutorial program schedule as developed by the Ripley House Community Center.

Although 29 subjects began participating in the study, the posttest was administered to a total of 20 students, ten designated as Experimental (four in Experimental Group I and six in Experimental Group II) and ten students designated as Control (five in Control Group I and five in Control Group II).

All the students in the Experimental Groups I and II were combined and ranked from the most to the least gained points on the posttest. Likewise, Control Groups I and II were combined and ranked from the most to the least gained points on the posttest. From the experimental group ranking, five students were selected for further interviewing and analysis. The two students who gained the most, the two students who gained at the middle and the student who gained the least amount of points on the posttest were selected. The five students selected from the Control Group were: the student who gained the most, the two at the middle, and the two who gained the least amount of points.

During the week following the completion of the study, each of the ten students was interviewed individually at the Ripley House Community Center. In addition, the student's academic records for the first grading period for the 1983-84 school year and a brief student profile was obtained. Further, the four participating teachers were individually interviewed.

Instruments

All the participating subjects in both the control and experimental groups were pretested with the Gates MacGinite Reading Tests, a measurement which is employed by the Ripley House Community Center as a means of assessing the children enrolled in the program.

The Gates MacGinite Reading Test is divided into two subtests, one testing vocabulary while the other tests comprehension. The vocabulary section contains 45 items which survey the depth of the student's general reading vocabulary. There are four multiple-choice answers to each question. The student selects the nearest synonym for each given word. The comprehension section consists of 22 items with a two-part answer for each.

The manual reported alternate-form and split-half reliability coefficients. The alternate-form reliabilities ranged from 0.78 to 0.89 with the intertest correlations falling below the alternate-form reliabilities. However, no exact description was given on the sample, except to say that the communities were carefully selected on the basis of size, geographical location, average educational level and average family income.

This test allows for the selection of students for further individual diagnosis and help, for evaluating the general effects of instructional programs, for counseling students, and as a means of reporting to parents and the community (Gates-MacGinite Reading Tests Teacher's Manual, 1978). However, Millman (in Buros, 1972) indicated that a rough analysis of reading difficulties is possible with this measurement if the test is used as a diagnostic supplement to reading tests in achievement test batteries. If used alone, the vocabulary and comprehension tests function better as survey tests.

Subjects

Sixty students were enrolled in the tutorial program, but only 29 students qualified for participation in the study. Qualification was determined by three criteria: 1) parental permission, 2) no conflict with other after-school activities, and 3) arrival at the center by a designated time. Twenty-nine students participated in the study during the two-week period but only 20 students were able to take the posttest. Two had moved during the latter part of the two-week period and the remaining were suspended from school or the center.

All the participants were students who had been referred to the center by the school district. They had been identified as having very poor academic skills, learning disabilities, family problems, psychological problems, and extreme aggressive behavior.

The ethnic background of the subjects was Mexican-American or Mexican from a low SES. They lived within close proximity of the Center and attended one of the four neighboring elementary schools.

Eight females and 21 males participated in this study. Control Group I consisted of five females and two males, Control Group II consisted of one female and six males, Experimental Group I consisted of two females and six males and Experimental Group II consisted of seven males.

The subjects ranged from the second to the sixth grade with a range of 8 to 14 years of age. The subjects included one second grader, two third graders, fourteen fourth graders, seven fifth graders and five sixth graders.

In addition, Spanish was the principal language spoken at home. While most of the parents spoke Spanish, a few could also speak a little English.

Tables 1, 2, and 3 describe the subjects by sex, grade and age.

Table 1: Sex of subjects by treatment group (n=29)

Sex	Control Group		Experiment Group		Total
	I	II	I	II	
Males	2	6	6	7	21
Females	5	1	2	0	8
Total	7	7	8	7	29

Procedure

Carefully outlined lesson plans were developed for all the participating teachers. The lesson plans for the control teachers strictly followed the teacher's guide to the textbook, *Widening Circles*, while the lesson plans for the experimental groups followed the Suggestopedic method.

Both groups used *Widening Circles* (1979), a third grade basal reader. The control groups used the textbook as published. The experimental groups also used the same textbook. However, the experimental lessons

Table 2: Grade level of subjects by treatment group (n=29)

Grade	Control Group		Experiment Group		Total
	I	II	I	II	
2	1	0	0	0	1
3	1	1	0	0	2
4	5	3	4	2	14
5	0	3	2	2	7
6	0	0	2	3	5
Total	7	7	8	7	29

Table 3: Age of subjects by treatment group (n=29)

Age	Control Group		Experiment Group		Total
	I	II	I	II	
8	1	0	0	0	1
9	2	0	0	0	2
10	4	3	0	0	7
11	0	4	2	0	6
12	0	0	6	0	6
13	0	0	0	5	5
14	0	0	0	2	2
Total	7	7	8	7	29

were altered so the stories reread by the subjects dur-

ing the passive concert portion of the lesson would be in communicative dialogue fashion; see Example 1 for a portion of the story. Further, the experimental lessons were also presented in colorful cartoons during the active concert portion of the lesson, utilizing the same communicative dialogue.

Example 1

Storyteller:

When it is story telling time in the lands of Africa, shouts go up from the children. "Anansi, Anansi, the spider; tell about Anansi!"

When it is story time in other parts of the world, shouts go up from the children. "Anansi, Anansi, the spider; tell us an Anansi story!"

Yes, children all over the world want to hear stories about Anansi, the spider. There are many stories about Anansi, the spider. There is even a saying in Africa: "All stories are Anansi's." But long ago that had not been so. Listen!

Chief god:

I own all stories. Yes, I own all stories. All stories belong to me.

Anansi:

I have no stories. I want some stories, too. I want all the stories to be about me, Anansi, the spider. etc.

Initially, the two experimental groups began with a brief explanation of the Suggestopedic technique and a relaxation period, along with short explanatory statements about the benefits of the Suggestopedic technique.

The following procedure for each experimental class session was adhered to for the two weeks of the study: 1) relaxation period; 2) active concert: presentation of new material, and 3) passive concert: the relaxation period when the new material was reinforced. Every other day the new material was activated by the use of games. Several games were employed during these sessions. Examples of the games are:

1. Charades: A list of verbs from the text was written on a poster. Students took turns going up before the group to act them out for each other. The student who guessed correctly received five points. If the student was able to make up a sentence with the verb, he/she received 20 points.

2. Concentration: Cards with vocabulary words and with the definition were made for this game. Cards were shuffled and placed face down in three rows of three on the floor. Students tried to turn up matching pairs (a matching pair is the vocabulary word and its definition). If the pair they turned up didn't match, they turned it face down again in the same place. If a pair turned up, the player kept it. The player with the most pairs at the end of the game was the winner.

On the final day of the treatment period, all groups were administered the same Gates-MacGinite Reading Tests as a posttest.

Data Analysis and Results

The data analysis was divided into two separate phases; Phase I which analyzed the empirical study and Phase II which deals with ethnography.

Phase I

A *t*-test was employed to test the statistical significance between the pretest and the posttest means of the treatment groups. The experimental groups reflected a significantly higher mean gain at the .01 level as shown on Table 4. Groups I and II in both the experimental and control were grouped together in the analysis.

Table 4: Analysis of test gain scores
by treatment group (n=20)

<i>Treatment Group</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
<i>Experimental groups</i>						
Total	10	21.70	11.92			
<i>Control groups</i>						
Total	10	3.90	9.75	3.47	18	.01

The first null hypothesis, which stated there would be no significant, positive second language acquisition between a control group traditionally taught and an experimental group exposed to Suggestopedia for one 60-minute period daily for a period of two weeks was rejected. There was a significant difference in the

posttest scores of the Gates MacGinitie Reading Tests in favor of the experimental group.

Phase II

The second phase of this study began with the ranking from highest to lowest of the students' results on the posttest. Table 5 reflects a ranking of the experimental groups according to the gained points. Subject numbers 1, 2, 6, 7, and 10 were selected for further interviewing and analysis. Table 6 shows the control groups ranked according to the points gained from the pretest to the posttest. Subjects numbers 1, 6, 7, 9, and 10 were selected from this group for further interviewing and analysis.

Table 5: Ranking of experimental students
by raw total scores

<i>Subject</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Points Gained</i>
1	30	73	42
2	43	75	32
3	28	60	32
4	28	56	28
5	12	32	20
6	48	66	18
7	49	58	17
8	49	63	14
9	29	38	9
10	41	45	4

Table 6: Ranking of control students
by raw total scores

Subject	Pretest	Posttest	Points Gained
1	57	74	17
2	48	64	16
3	57	69	12
4	42	50	8
5	32	37	5
6	40	43	3
7	45	44	-1
8	64	63	-1
9	446	37	-7
10	57	44	-13

Experimental group. The five students selected from the experimental group listed on Table 5 had some general similarities. All five students were right-handed boys between 12 and 14 years of age. The mean age of the group was 12.8 years. Although the major language spoken at home was Spanish, in four homes Spanish was the only language spoken.

All of the five students attended a Spanish-speaking church service. Two were Protestants and three Catholic. Two were very active in church, two somewhat active, while one was not active. "Very active" referred to attending church on Sundays, weekday service and participation in church organizations. "Somewhat active" referred to attending church on Sundays, while "not active" was defined as occasional attendance or non-attendance.

Each student had been held back one school year. Four out of the five students had participated in a bilingual class. Two students had each been in a bilingual class only one year, two were enrolled for five years each and one had never been in a bilingual class.

The overall average grades for the first 9 week grading period of the 1983-84 school term ranged from D to C. The conduct grades for the first 9 week grading period ranged from F to B, and the math grades from D- to B.

The strategies utilized by the experimental students were on three levels. Repetition (3 students) was a strategy based on motor responses. Socialization (1 student) was a strategy based on formal interaction. Visualization (2 students), a cognitive strategy, required the learner to create mental images of the material to be learned.

Control Group. A profile of the five control students selected reflected they were all right handed, all were born in Texas and in four out of five homes, Spanish was the principal language. The mean age of the group was 10.2 years.

The church affiliations of the five control students was: four out of the five when attending church, heard a service in Spanish. One student was Protestant and four were Catholic. One was very active, one somewhat active and three were not active in church.

Three students have been retained one year each in school, while two had not failed any grade. Two never participated in a bilingual classroom. One was in a bilingual classroom only in the first grade, another participated in a bilingual kindergarten, first and second

grades, and another was placed in a bilingual classroom at the second and third grades only.

The overall average grades for the first grading period of the 1983-84 school year ranged from D to B-. The conduct grade ranged from D to A, and the math grades from D to B.

Four of the five control students employed a form of strategy while attempting to learn. Only one has a systematic visualization approach to learning. Another has no defined strategy at all. Three had a repetition approach.

The second null hypothesis, which stated that there would be no difference in individual learning characteristics between the students exposed to Suggestopedia who scored high on the posttest and the students who scored low on the same posttest, was not rejected. The students participating in the experimental group who scored high and low employed similar learning characteristics. Further, four out of the five control students also employed the same learning strategy.

Results of Teacher Evaluations and Interviews

The control and the experimental teachers were asked to evaluate the types of students they were teaching and the learning problems the students possessed. The experimental teachers were questioned further on their perceptions of using Suggestopedia in the classroom.

The control teachers were an Anglo male and a Mexican-American female. The experimental teachers were a Mexican-American female and an Anglo female. The ages of the participating teachers ranged from

18-30, and they had worked at the Ripley House Community Center from one month to two years.

These four teachers perceived themselves as enjoying working with children most of the time and sometimes getting frustrated with the children. One experimental and one control teacher further felt discipline was important all of the time, while the second experimental and the second control teacher felt discipline was important most of the time. However, both control teachers and one experimental teacher described themselves as strong disciplinarians most of the time. The other experimental teacher did not view herself as a strong disciplinarian.

When asked about the types of learning difficulties the children had, both control and both experimental teachers indicated that the difficulties were academic, behavioral and linguistic. The control teachers believed that the students were weakest in their knowledge and understanding of the English language. The experimental teachers, on the other hand, felt that the students were weak in English, math, history, spelling, reading and comprehension.

When asked on the questionnaire the reasons for the students' weaknesses in the academic areas, all four teachers responded that the reasons were: 1) lack of family interest, 2) lack of interest in school, 3) behavioral problems, 4) lack of skills, 5) inability to understand the English language, and 6) being slow learners. Yet when interviewed, three of the four teachers who had visited the homes of the participating students felt the parents were concerned about their children's academic needs. These same four teachers also felt that the families' poor economic conditions were contributors to the students' academic problems. All four teachers described the families as low income families.

When asked about the productivity of the study, all four teachers indicated that the two weeks of the study had been somewhat productive. In the initial interviews, both the control teachers had indicated real doubt as to the success of any short-term study. Although the Suggestopedic method was briefly described to the control teachers, one control teacher stated that relaxation would seem to enhance learning, but added "I don't know whether music or classical music is the way to do that or not. Obviously, it's one way to calm the kids down some." At the end of the two-week period, when self-evaluating their performance, both experimental teachers and one control teacher felt that they had been effective with the students, while the female control teacher described herself as "possibly" effective.

Both the control teachers indicated that the lessons selected for the students had been too easy, while the experimental teachers felt the lessons were moderately difficult.

When the experimental teachers were asked if they felt the method worked, their responses was "possibly." However, when asked about the receptiveness of the students to Suggestopedia, one felt the students were "possibly" receptive while the other felt the students were not at all receptive. This same teacher's response to the relaxation exercises was that "it was harder for them to get into it because it was so different--for them to do the relaxation exercises. I think a lot of them thought it was silly."

One experimental teacher also felt that the students would definitely learn more easily with this method, while the other was doubtful.

The two experimental teachers were also questioned about the effectiveness of the relaxation portion of the method in calming their students. One teacher felt that the relaxation was possibly effective in calming the students while the other teacher felt it was not at all effective. Yet both teachers indicated that the students definitely actively participated in the lessons and in the games.

One experimental teacher definitely was interested in utilizing this method again, while the other responded with the reply of "possibly."

Results of Students' Interviews

The five experimental and the five control students were first asked general information questions. When asked for their favorite subject, all ten students, the five control and the five experimental, responded with math.

The experimental group was asked if they liked to read. Four out of the five students stated they liked to read. They were also asked if they owned books.

The responses from the students in the control group on whether they liked to read were: one "yes," one "sometimes," and three "no."

The five students selected from the experimental group were questioned about Suggestopedia. When asked how they liked this method of learning, all five students responded affirmatively.

Tomas responded, "It was good. Because I learn a lot. I learn how to read, how to pronounce the words."

When asked about the relaxation exercises, Luis thought it was boring. "The only thing that got me bored was the -- the relaxation." However, he felt the relaxation exercises were important, "because if it wouldn't of help me they wouldn't of put it there."

The students were asked to describe their learning style and any kind of procedure they might employ when attempting to learn. When examining the use of student strategies, it was discovered that three levels of strategies were utilized by the students. Two students used a complex cognitive strategy, one a social strategy, and the rest used a strategy based on motor responses.

For example, Esteban described his procedure, first "I look it up in the dictionary." After discovering the definition in the dictionary, he mentally repeated the word, "until I memorize it." He visualized the word in his mind and associated the object or definition to the word.

The students selected from the control groups also had similar learning strategies. One, for example, followed a routine of looking the word up in a dictionary and mentally trying to associate the definition with the word.

Discussion of Research Questions

The first question asked if experimental students employed learning strategies which result in higher scores on the posttest. Student responses from the interviews formed the basis for this analysis. The results indicated that although all the students had developed a learning strategy, the students who obtained the highest gain had more defined strategies than the students who made lower gains.

The analysis of the second question whether control students who scored lower on the posttest employed different learning strategies than the experimental students, was based on student responses on the interviews following the first portion of the study. The results reflected that the control students employed very similar learning characteristics to the experimental students.

Student responses in the interviews were used to evaluate whether Suggestopedia was helpful in learning. All five experimental students indicated they enjoyed learning through Suggestopedia.

The fourth question asked if the experimental teachers evaluated Suggestopedia as being helpful in learning. They did not show agreement as to the helpfulness of Suggestopedia. One experimental teacher replied with a definite agreement, while the second experimental teacher's response was dubious.

The fifth question, whether the experimental teachers found the groups receptive to the Suggestopedic method, received mixed responses. One teacher said that the students were receptive, while the second teacher reported that her students were not at all receptive.

Discussion

The implementation of the Suggestopedic technique with second language learners is one which merits great consideration. This approach causes the learner to incorporate the right and the left hemispheres of the brain into a harmonious unit for maximized efficiency. Proponents of Suggestopedia claim that presently the majority of the classroom teaching is directed to the left hemisphere, a more semantic or analytical form of

processing. Yet, adolescents learning English as a second language have a right hemisphere preference for processing information (Lambert, 1979). Since adolescent second language learners are prone to right hemisphere based strategies, a gestalt-like form of processing, the utilization of this approach would be beneficial to public school students learning English as a second language. This study confirmed that learning was greater in the Suggestopedic group.

The utilization of Suggestopedia in language learning clearly affects learning efficiency and learning efficiency is directly affected by the use of learning strategies. Any learning strategy seems to provide for learning enhancement through Suggestopedia.

The students participating in this study were students who had academic difficulties resulting from their inability to function adequately in the English language. A major contributor to this language deficiency was their haphazard participation in bilingual programs. Except for two students, who began in the first grade, none of the other students had been in a bilingual classroom consecutively and consistently enough to merit its benefits.

Although the bilingual educational programs have been in existence for some time, there appear to be implementation inconsistencies.

The poor academic performance of these students corroborated Cummins' Threshold Hypothesis. This hypothesis was developed to address the positive and negative inconsistencies between bilingualism and cognition. Cummins stated (1978, p. 39) that "the cognitive and academic effects of bilingualism are mediated by the levels of competence attained in L1 and L2." In other words, the bilingual child must attain certain levels of linguistic competence in order to avoid "cognitive

disadvantages and allow the potentially beneficial aspects of becoming bilingual to influence his cognitive functioning" (Cumming, 1978, p. 1). This means that there is a threshold level of competence in the second language the student must attain in order to avoid cognitive disadvantages and to benefit from the bilingual influence on cognitive functioning.

Because the students utilized in this study were not allowed to develop adequately in the first language, they demonstrated a poor command of the first language. This deficiency produced inadequate competence in the second language. Nonparticipation in a bilingual program substantiates Walker de Felix and Acton's (1984) application of Hamilton's unified model of cognitive processing. This model specifies that the absence of effective instruction in the home language prohibits the learning from attaching more refined semantic labels to more complex objects and experiences. The absence of first language development prevents the learner from producing more complex thought patterns and cognitive processes. Apparently some teachers of the subjects in this study attributed their students' poor academic achievement to linguistic factors rather than considering the sociocultural and school programs as the important contributory variables in achievement.

Two students who made the greatest gains were not only the most goal-directed or motivated but, because of their active church participation reinforcing the home language, they had been able to develop a more complex learning strategy: visualization.

Visualization or forming images of the material to be learned increases its memorability (Reese, 1977). In other words, imagery facilitates acquisition. Learning enhancement, as a result of this type of strategy, sup-

ports Paivio's (1971) claim that pictures are more concrete than words. Thus, recall will be facilitated when mental images are formed about information.

The inner motivation of these two students was high. Jose was motivated by need and challenge. His motivation resulted from interaction with his peers and the school, his major socializing agents. This motivation supports the view that cognitive development is a direct outcome of the interaction of the individual with the environment (Walker de Felix and Acton, 1984). Jose wanted to learn English because "sometimes I miss and they laugh at school." He was also interested in the Suggestopedic classes because it was better for him than being at home "watching cartoons."

Socialization was only one of Luis' strategies. His other strategy was one that all the remaining students had in common. Their strategy was not as complex as that of Jose's but based on motor responses. According to Craik and Lockhart (1972), information is strategized at different levels. Information which is handled in terms of physical features is at the lowest level.

These students perceive learning as an exercise in repetition rather than cognitive intergration. They write the word of concept to be learned over and over until it becomes an automatic muscular response. This strategy, however, has its limitations and is not always dependable.

Limitations

The use of Suggestopedia in this study was positive and the participants enjoyed learning with this method. At the end of the second day of class, one of the control students said, "I want to be changed. I want to

be in that class because they're doing fun stuff. I don't want to be in my class because it's boring."

Clearly, the posttest results indicted a marked gain in scores for the experimental group as opposed to the control group. However, a number of situations must be taken into consideration when the results are interpreted. This study was characterized by the following: the total amount of participants posttested was only 20; although randomly assigned, the experimental and control subjects were not matched in age, grade or sex; there was a 7.2 to 1 relationship (seven or eight students to one teacher); the pretest and the posttest were administered with a span of three weeks; except for the additional two days of testing, the students were aware the length of the study would only be two weeks; grammar was taught only briefly during the vocabulary section of the lessons; the third grade reader utilized in this study was a textbook that the students were familiar with and had sometimes used in the classroom; the experimental students averaged 2.6 years older than the control students; the students were not threatened by a final achievement grade at the end of the study.

Recommendations

As a result of this study, personal observations, and teacher and student responses, recommendations for future research and for application are offered. Further research utilizing Suggestopedia with students who have language difficulties should be conducted, particularly with students who are second language learners.

Also needed is research on teacher bias, in that enthusiasm for the technique is determined largely by the teacher. Course materials need to be developed and researched so that they appropriately follow the

Suggestopedic style. The fundamental and theoretical aspects of Suggestopedia are readily available. However, a clear and concise procedure for course development and textbook adaptation of Suggestopedia needs to be developed.

The utilization and application of Suggestopedia to the suggested areas creates new avenues for research. Clear modification of the technique for effective use in the American classroom is necessary. The possibilities for future research are challenging.

Implications

The utilization of Suggestopedia in a second language learning environment demonstrated certain interesting aspects. First, Suggestopedia was proven to work even in a short period of time. Suggestopedia was effective with students classified as learning failures. The methodology allowed for the development of more complex strategies which in turn are more effective in learning.

Based on this study, the incorporation of this methodology in a second language learning classroom situation such as English as a Second Language (ESL) would be beneficial because the students perceive this environment as "fun." Learning takes place in a creative and nonthreatening setting.

The incorporation of graphics into the lessons provides the students with an opportunity to visually and concretely see a definition or concept. Material to be learned which has been incorporated becomes more effective when pictorial elaborations have been incorporated (Reese, 1977). Animated cartoons are even more effective memory aids (Rohwer, 1967). In addition, stu-

dents enthusiastically endorse the imagery mnemotechnics.

The immediate positive results accomplished through Suggestopedia provided the students with a new self-confidence which poor academic achievement had destroyed.

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Der Gebrauch der Suggestopädie bei begrenzt englisch sprechenden lateinamerikanischen Grundschülern.

Eine der Suggestopädie ähnelnde Methode wurde in einer Klassenzimmerstudie angewendet um festzustellen, ob es eine bedeutende Auswirkung auf die Lernfähigkeit in der englischen Sprache auf lateinamerikanische Grundschüler schaffen mag die augsgewiesen waren, begrenzte Fähigkeiten in der englischen Sprache zu haben. In der ersten Phase, der empirischen Studie, waren die Ergebnisse des Gates-MacGinitie Vokabelabschlusstests mit $p = .05$ signifikant und der Verständnistest war signifikant mit $p = .001$. Phase II, ethnographisch, untersuchte die individuellen Lernstrategien der Schüler um festzustellen ob bestimmte Strategien einen effektiveren Suggestopädiestudenten ausmachen. Die der Suggestopädie ähnelnde Methode schien eine Entwicklung von Lernstrategien zu fördern.

Une Approche Quasi-Suggestopédique Destinée aux Jeunes Elèves de Langue Maternelle Espagnole ayant une Connaissance Limitée de l'Anglais Parlé.

Une approche ressemblant à la Suggestopédie a été adoptée dans une classe pour déterminer si cette dernière pourrait avoir un effet significatif quant à l'efficacité de l'apprentissage de l'anglais par des élèves de langue maternelle espagnole ayant une connaissance limitée de distinctes. Dans la première phase, la partie empirique, les résultats du post-test de vocabulaire Gates-MacGinitie ont été significatifs au niveau de $p = .05$, et ceux du test de compréhension au niveau de $p = .001$. Dans la deuxième phase, la partie ethnographique de l'étude, il s'agissait d'examiner les différentes stratégies, d'apprentissage de chaque élève afin de voir si, en fait, grâce à certaines stratégies d'apprentissage personnelles, certains élèves réussissent mieux dans une approche suggestopédique. Cette nouvelle approche de type Suggestopédique semblait faciliter le développement des stratégies d'apprentissage.

Uso de la Sugestopedia en alumnos hispanos de Primaria con un limitado nivel de inglés.

Un método sugestopedico fue utilizado en el escenario de una clase para determinar si este podría proporcionar un efecto significativo en el aprendizaje de la lengua inglés en alumnos hispanos de escuela Primaria identificados con unas habilidades limitadas de habla inglesa. En la fase I, la del estudio empirico, los resultados del post examen de vocabulario Gates, MacGinitie fueron significativos en el $p < .05$ al igual que los de Comprensión lo fueron en el $p < .001$. En la fase II, la etnográfica se examinaron las estrategias del aprendizaje individual del estudiante para determinar si ciertas

estrategias individuales constituían un estudiante sugestopédico mas efectivo. Este método sugestopédico parecía facilitar el desarrollo estratégico del aprendizaje.

**Relaxation and Educational Outcomes:
A Meta-Analysis**

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Abstract. A meta-analysis was conducted on 20 studies of the effects of relaxation on achievement. The data base searched was PsychINFO. The 36 effect sizes revealed a small positive effect on cognitive academic variables representing achievement for elementary school children and college students. Design and treatment flaws, however, may have biased the results.

* * * * *

Introduction

Psychologists are once again turning their attention to the study of consciousness. Extensive writing about consciousness is appearing in professional journals and psychology texts. Groups interested in the study of consciousness are rapidly forming all over the world. It is a topic which many scholars are realizing has far reaching implications for the understanding of human beings' growth, development, learning and performance.

As is usually the case, education follows closely behind advances in psychology and this is happening in the area of consciousness. Due primarily to the work

of Thomas Roberts (1985), consciousness education is developing into a viable field of investigation and development. One of Roberts' main points is that certain abilities are stronger in some states of consciousness than in others. Since it has been speculated that there are at least hundreds, and possibly thousands, of states of consciousness available to humans, the implications for investigation are truly incredible.

A great deal of work is in progress to investigate the effects of various states of consciousness on learning and performance. Some of it is empirically based--much of it is not. There has not been an attempt to draw together this work to determine that the effects of any one state of consciousness have on learning and performance. The purpose of this study was to examine one state of consciousness, relaxation, and through the use of meta-analysis, draw conclusions regarding the effects of relaxation on learning and performance-- more specifically, academic achievement.

The focus of this study was on empirical experimental investigations so that effect sizes could be computed and analyzed. Two major problems immediately presented themselves in this endeavor. First, there was little standardization of techniques to facilitate relaxation and, in fact, relaxation itself was often referred to by many different names. Therefore, the following categories were used to distinguish among the various forms of mind and body relaxation techniques: (a) kinesthetics, (b) progressive relaxation, (c) progressive relaxation and music, (d) progressive relaxation and imagery.

Studies were then analyzed across all of these techniques and analyzed individually according to each of the four categories. The criteria used to select relevant studies were based on whether the techniques used to

facilitate an altered state of consciousness fit into one of the aforementioned categories.

Secondly, many studies use a technique to facilitate relaxation in subjects and then investigate the relationship between subjects being submitted to the technique and their achievement and performance. A major problem arose as most investigators did not monitor the physiological condition of the subjects to determine whether the subjects were exhibiting physiological indications of a relaxed state such as muscle tension monitoring, skin temperature changes, breathing changes, brain wave production or heart rate changes. Therefore, it was not always possible to say that relaxation has an effect on achievement, only that the technique which should, theoretically, facilitate relaxation is related to achievement. In the present analysis studies were analyzed in two categories: 1) those studies where physiological monitoring indicated the level of relaxation achieved by subjects and 2) those that simply assumed that the selected technique resulted in relaxation.

This study provided valuable information regarding the effects of relaxation on achievement and performance.

Method

PsychINFO, the data basis of the American Psychological Association, was searched by means of DIALOG, the information retrieval service. The 20 studies that contained the relevant statistics summarizing cognitive outcomes and types of relaxation techniques included 5 dissertations, 2 convention presentations and 13 journal articles. An additional 19 studies did not contain enough statistics to compute effect sizes.

The cognitive outcome variables were either learning aptitude or school achievement, including both standardized and teacher- or researcher-made tests. Scores were obtained following the application of the relaxation treatments, thus coming from final-status variables. Some of the studies containing insufficient statistics used analysis of covariance or difference scores. Problems with these measures of dependent variables are described in Glass, McGaw, and Smith (1981).

All of the studies in the final set used a control group to compare the effects of one or more relaxation techniques. The type of relaxation technique was coded as: (a) physical body work focusing primarily on kinesthetics--1, (b) guided mind/body calming, including hypnosis, progressive relaxation, meditation--2, (c) progressive relaxation combined with music--3, and (d) progressive relaxation combined with imagery, fantasy, daydreaming--4. Each study was analyzed to determine if a measure of physiological relaxation was used to validate the relaxation treatments.

Following procedures described in Glass, McGaw, and Smith (1981), 36 effect sizes were extracted from the reports. Each effect size was found by subtracting the mean of the control group from the mean of the treatment group and dividing by the control group standard deviation. Since the sample effect size is a biased estimate of the population effect size Delta (Hedges, 1979), each of the sample effect sizes was multiplied by a correction factor K tabled in Hedges (1981) and reproduced in Glass, McGaw, and Smith (1981). The product is an unbiased estimate of Delta. The distribution of Delta's was graphed as a stem- and-leaf display (Tukey, 1977).

Results and Discussion

The results are summarized in Table 1 and Figure 1.

Table 1: Descriptive Statistics of Effect Sizes
for Sizes of Relaxation Techniques.

	<i>Relaxation Technique*</i>				
	1	2	3	4	Total
Mean	.178	.195	.059	.211	.162
Var.	---	.526	.396	.932	.529
Mdn.	.178	.232	.146	.171	.160
n	1	22	9	4	36

*: 1=kinesthetics, 2=progressive relaxation,

3=progressive relaxation and music,

4=progressive relaxation with imagery.

The average effect of relaxation on cognitive outcomes when compared to a control group was .162 standard deviation. The average subject who received some relaxation technique exceeds 56% of the control subjects on the cognitive outcome variables. The 90% confidence interval of the true average Delta is 0.017 to 0.307.

The type of relaxation technique labeled progressive relaxation had an average effect of 0.195 standard deviation. The average subject receiving this kind of relaxation technique exceeds 58% of the control subjects on cognitive variables. The 90% confidence interval for this group is 0.011 to 0.379.

DEPTH	STEM	*	LEAVES
		*	
12	-0	Q	011233333444
13		*	5
+17	0	Md	00011112222233344
6		*	677
3	1	*	0
2		*	57
		*	
		*	

MINIMUM = -.572
 MAXIMUM = 1.739

Fig. 1 Stem and Leaf Display of Effect Sizes for Combined Groups.

Due to the relatively small number of studies in the remaining categories of relaxation, and the degree of skewness exhibited in the distributions, it would be misleading and inappropriate to interpret average effects under the assumption of normality. Furthermore, only one study (Hull, Render & Moon, 1987) was found that checked on the validity of the relaxation treatment by administering a measure of physiological response. Therefore, the results for the total sample and the category of progressive relaxation seem to provide the strongest basis for interpretation.

About 50% of the studies used college undergraduates as subjects; the other half used elementary school pupils. Almost all of the reports featured some procedures for controlling extraneous variance, from matched controls to random assignment of subjects to groups. However, few studies reported "blind" experimenters, accounted for experimental mortality, or included a placebo. The allegiance of the experimenters relative to their commitment to relaxation techniques was not well controlled and difficult to assess.

Relaxation techniques in general, and progressive relaxation techniques in particular, have a small positive effect on cognitive academic variables among elementary school children and college-level students from these 20 studies taken as a whole. This conclusion may not reflect the actual relationship, however, due to design and treatment implementation flaws that generally plagued the analyzed reports. As more studies accumulate, it will be possible to code and compare various methodological characteristics to determine the extent to which they influence the relationship between relaxation techniques and cognitive outcomes.

Another important class of school outcomes is affective. A future meta-analysis might examine the relationship between relaxation and anxiety within educational contexts. There is perhaps a stronger theoretical framework for justifying the expectation that relaxation techniques will positively influence affective educational outcomes.

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Entspannung und Ausbildungsergebnisse: eine Meta-Analyse

Eine Meta-Analyse an 20 Studien des Entspannungseffekts auf Leistung wurde unternommen. Die untersuchte Datenbasis war PsychINFO. Die 36 Wirkungsgrößen enthüllten einen geringen positiven Einfluss auf cognitive akademische Grössen, die Leistung für Grunschulkinder un Universitätsstudenten kennzeichnen. Planungs- und Ausführungsfehler jedoch, mögen die Resultate entstellt haben.

Relaxation et Résultats Pédagogiques: une Méta-analyse

Une méta-analyse a été effectuée sur 20 études qui avaient pour but d'étudier les effets de la relaxation sur la réussite scolaire. La banque de données consultée a été PsychINFO. Les 36 "effect sizes" ont révélé un faible effet positif sur les variables cognitives et scolaires qui représentent le succès scolaire pour de jeunes élèves et des universitaires. Il est possible cependant que les imperfections dans l'organization et le traitement de l'étude aient faussé les résultats.

Resultados de Relajación y de Educación: Un Meta-análisis

Un meta-análisis fué llevado a cabo con 20 estudios relacionados con los efectos de la relajación durante su ejecución. Los datos fueron encontrados en PsychINFO. Los 36 tipos de efectos revelaron un pequeño efecto positivo en las variables cognitivas académicas representando consecución sin embargo las imperfecciones del diseño y del tratamiento pueden influir en los resultados.

**A Meta-analysis of the Effects of Suggestopedia,
Suggestology, Suggestive-accelerative
Learning and Teaching (SALT), and Superlearning
on Cognitive and Affective Outcomes**

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Abstract. A meta-analysis was conducted on 14 studies on components of Lozanov's method to accelerate learning. The 53 effect sizes revealed a substantial difference in performance as a result of the suggestion treatment. The results were consistent for both cognitive and affective outcomes.

* * * * *

Introduction

It has been five years since the National Commission on Excellence in Education published its findings. Resulting from that commission has been an increased assessment of the many and varied aspects of learning and education. There have been many recommendations to adjust the educational system, structure, and methods, to increase effective learning.

One of the potentially positive aspects of this national attention to education is that the available and ever increasing empirical knowledge in human learning

may be scrutinized by those in positions to initiate changes in the educational community.

One area of research that continues to offer increased empirical knowledge and promise for more effective and efficient learning is the area of suggestive-accelerative learning and teaching (e.g., Baur & Eichhoff, 1981). Developed by Dr. Georgi Lozanov (1971, 1975) suggestive-accelerative learning and teaching recognizes the potential of the unconscious processes in humans and utilizes this unconscious mental activity in increasing recall of old information and in learning new. Utilizing and refining the methods of relaxation, positive suggestion, pacing of material, music and yoga breathing, he produced a method that has been found to be generally effective in learning and retaining what is learned, originally used in foreign language acquisition.

The Lozanov method allows an indirect suggestive atmosphere conducive to learning to be established which supposedly produces a holistic balance of mind and body and conscious/unconscious. In this atmosphere, a visual and verbal suggestion format of delivery is used, interspersed at specific points with relaxation suggestions and/or exercises. At the time of language instruction, soft Baroque music is played. Verbal messages/instructions about positive expectations that learning will take place are also given. Though developed primarily for foreign language acquisition, Lozanov's methods have been adapted and applied to other types of outcomes, such as attitudes and creativity, with measurable success (e.g., Schuster, Prichard, & McCullough, 1981).

Method

Forty studies using one or more components of Lozanov's method to accelerate learning were identified from a search of a complete set of issues of the *Journal of Suggestive-Accelerative Learning and Teaching* (now called the *Journal of the Society for Accelerative Learning and Teaching*). Of these 40, 14 studies contained sufficient statistics to compute effect sizes.

The studies were coded according to substantive and methodological characteristics. One substantive characteristic was type of outcome. A study was coded "1" if it measured foreign language acquisition, "2" if it measured foreign language retention, "3" if it measured an affective attribute, such as attitude or self-concept, or "4" if it measured creativity or other cognitive capabilities.

A second substantive characteristic was type of treatment. A study was coded "1" if it included explicit suggestion (of rapid or easy learning) or de-suggestion (of slow or difficult learning), or "2" if it included only implicit suggestion or de-suggestion. Explicit suggestion operational definitions generally featured imagery, relaxation, music, and dramatic presentations in various combinations with visual and verbal suggestions. Operational definitions of implicit suggestion tended to feature only some combination of relaxation and music.

The methodological characteristic that was taken into account was degree of internal validity. Originally, each study was ranked on a scale of "1" to "5" where "1" represented no control and "5" indicated excellent control to examine the relationship between effect size and extent of control. To report average effect sizes by methodological quality of study, levels "1" and "2" were

collapsed into "weak" and "3" and "4" were collapsed into "strong." No study was rated excellent with a ranking of "5."

The dependent variables were measured on final status to achieve greater comparability. Studies reporting results using difference scores or residuals were not included, nor were studies that reported statistics from which effect sizes could not be recovered. All of the studies in the final set used a control group as the reference for contrasting various suggestology treatments.

Following procedures described in Glass, McGaw, and Smith (1981), 53 effect sizes were extracted from the reports. Each effect size Delta was found by subtracting the mean of the control group from the mean of the treatment group and dividing by the control group standard deviation. In some reports, the control group standard deviation had to be estimated from sums of squares or mean squares in analysis of variance summary tables. Thus, each effect size is the distance a treatment mean is from a control mean in control group standard deviation units.

Results and Discussion

The distribution of effect sizes over all categories and outcomes was leptokurtic and positively skewed. The mean effect size was 1.70 SD, but a more representative measure of central tendency for this distribution would be the median effect size, which was .750. The overall performance of subjects under suggestology was three-quarters of a standard deviation higher than the median performance of subjects under control conditions.

The subset of studies that focused on the outcome of foreign language acquisition ($N = 11$) produced a median effect size of .68 SD. Those studies using the outcome of foreign language retention ($N = 8$) yielded a median effect size of 2.29 SD. The reports that examined the effects of suggestology on affective outcomes ($N = 20$) resulted in a median effect size of .74 SD. The remaining reports investigated cognitive achievement and creativity ($N = 14$) from which a median effect size of .650 was obtained.

There was no evidence that the methodological quality of the studies covaried linearly with effect size ($r = -.01$). However, all of the foreign language outcome studies were rated "weak" in terms of internal validity, whereas most of the affective and cognitive outcome studies were judged "strong" in terms of control. The variability of effect size was greater for poorly controlled studies.

Table 1 summarizes the median effect sizes by outcome, degree of control, and type of treatment. For foreign language acquisition, the larger effect size was under the condition of direct suggestion (.74). Direct suggestion also produced the larger effect size for foreign language retention (3.00). Affective outcomes with strong control (.75), and cognitive capabilities, including creativity, with strong control (1.14) yielded effect sizes greater than those under weak control by direct suggestion. There were no studies that could be classified under indirect suggestion that were also well-controlled.

Despite the fact that all of the foreign language outcome studies, both acquisition and retention, were classified as lacking in methodological rigor, subjects under either direct or indirect suggestion perform about

.7 standard deviation higher on the average on measures of foreign language acquisition than subjects under the control condition. More dramatic was the magnitude of the effect of direct suggestion on foreign language retention, nearly three times the magnitude of the effect of indirect suggestion on foreign language retention. Given the uniformly low quality of these reports, a more conservative estimate of the effect size is probably about 1 standard deviation, which still represents a substantial difference in favor of the suggestion treatment.

Table 1: Median Effect Sizes of the Four Types of Outcome

<i>Outcome</i>	<i>Direct Suggestion</i>		<i>Indirect Suggestion</i>	
	<i>Delta</i>	<i>n</i>	<i>Delta</i>	<i>n</i>
1-Foreign Language Acquisition	.74	8	.68	3
2-Foreign Language Retention	3.00	5	1.13	3
3-Affective Attributes	.75*	14		
4-Cognitive Achievement and Creativity	1.14**	9		

*: Well-controlled; effect size for poorly controlled was .43 (n=6)

**: Well-controlled; effect size for poorly controlled was .35 (n=5)

Degree of control was related to effect size for the non-foreign language outcomes of affective characteristics (i.e., attitude, self-concept) and cognitive skills (i.e., school achievement, creativity). Subjects under the suggestion treatment performed .75 standard deviation higher than control subjects in well-controlled studies of affective attribute, but only .43 standard deviation better in poorly-controlled studies, on the average. Subjects under the suggestion condition performed over 1 standard deviation higher than control condition subjects in well-controlled studies of cognitive capabilities, but only .35 standard deviation better in poorly-controlled studies, on the average.

Because the assumption of independent observations was violated, no statistical inferential procedures were applied, and no attempt to generalize beyond these results is warranted. Hypothesis testing procedures are not robust with respect to violations of this key assumption. Furthermore, the effects of violating this assumption on errors in decision making are unpredictable. Methods of compensating for "lumpy" data are neither widely accepted nor routinely employed by statisticians.

Since all reports came from a single journal devoted to this particular phenomenon, the results are probably influenced by publication bias. This conclusion must be qualified, however, by the fact that 10 of 53 effect sizes were zero or negative.

The evidence, taken on the whole, seems to support the conclusion that, for these studies, the Lozanov method with explicit suggestion is more effective than untreated controls relative to foreign language acquisition, foreign language retention, affective attributes, and cognitive achievement and creativity. Well-designed

studies exhibiting a high degree of internal validity have produced effect sizes from .75 to over 1 SD for affective outcomes and cognitive outcomes, respectively. One is less confident in the effect sizes for the foreign language outcomes due to weak internal validity and high variability. The findings are consistent with information processing theory (e.g., Sternberg, 1986).

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Eine Meta-Analyse der Auswirkung von Suggestopädie Suggestologie, Suggestiv-beschleunigtem Lernen und Lehren (SALT) und Superlernen auf cognitive und affektive Ergebnisse.

Eine Meta-Analyse von 14 Studien mit Bestandteilen von Lozanovs Methode über beschleunigtes Lernen wurde unternommen. Die 53 Wirkungsgrößen ergaben einen substantiellen Unterschied in der Leistung als Ergebnis der Suggestionsbehandlung. Die Resultate waren für beide Ergebnisse, cognitive und affektive, konsistent.

Une Méta-Analyse des Effets de la Suggestopédie, de la Suggestologie, de l'Apprentissage et l'Enseignement Suggesto-Accélérateur (SALT) et 'Superlearning' sur les Résultats Cognitifs et Affectifs.

Une méta-analyse a été effectuée sur 14 études des composants de l'approche Lozanov qui sont censés accélérer l'art d'apprendre. Les 53 'effect sizes' ont révélé une différence importante quant au rendement cognitif et affectif grâce au traitement suggestopédique.

Un meta-análisis de los efectos de la Sugestopedia, la Sugestología, el aprendizaje y acelerada sugestiva (SALT), la enseñanza y el superaprendizaje en los resultados cognitivos y afectivos.

Un meta-análisis fue realizado con 14 estudios relacionados con los componentes del método de Lozanov para el aprendizaje acelerado. Los 53 tipos de efectos revelaron una diferencia substancial en la realización como resultado del tratamiento de sugestión. Los resultados fueron consistentes para ambos resultados tanto cognitivos como afectivos.

Alpha Brain Wave Formation by Sine Wave Stereo Sounds*

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Abstract. This paper deals with the alpha brain wave formation by aural means, both theoretically and practically considered. The author introduced first the magnetic field measurements around the brain which were conducted, not by the present author, at the Kokkaido University, the results of which were used by the present author for the theoretical explanation of Monroe's Hemi Sync tape. The former series was said to have been conducted by SQUID (Superconducting Quantum Interference Device) measurements around the head under the pure tone stimulation to one ear of the subject which induced a current dipole in the opposite brain hemisphere. The record of Hemi Sync tape is a stereo sound tape with two frequencies, e.g., 100 and 125Hz which may induce 25Hz in the subject's brain. The author has actually tried 100/108Hz and 100/104 frequency stereo tapes so as to induce alpha or theta brain waves.

The author considered the theoretical reason for brain wave changes with different frequencies and he attributed these to the non-linearity of the nervous system in the brain. After hear-

*Paper presented at the 1988 SALT Conference

ing these tapes, he has suggested several improvements for the sound tapes and recommended some practical application methods to SALT.

* * * * *

Introduction

The brain waves of most alert people are kept in the beta state except when they actively attempt to be in the alpha or other state, e.g. via biofeedback or meditation. However, these practices are, so to speak, active. On the other hand, there are three passive methods by which we can control our brain waves. They are: 1) weak electromagnetic field, 2) acoustical means, and 3) optical means. This paper will concentrate only on acoustical means because almost all the SALT practices focus on vocal and musical sounds and so these sounds may be a mixture of a number of sine waves of different frequencies. Noise is an example of the most complicated sound. The psychological effect of a noisy sound depends on its frequency characteristics. As the author pointed out before (Seki, 1984), the most important noise obeys the so-called $1/f$ law, because the sound of $1/f$ fluctuations gives us very comfortable feelings.

Some ten years ago, Dr. Norio Owaki told the author that he has studied the effect of pure sine waves of about 100 to 125Hz on brain waves and found that his subjects moved into alpha brain wave states. However, the reason why 100Hz sound can induce 10Hz has remained unexplainable. If our ear can hear 10Hz sound, it may be reasonable to assume that the brain is in the alpha state, but the aural sense is not able to detect sound under 16Hz. Saito et al. (1958)

carefully measured the frequency fluctuations of the human voice and found that the male voice of 100Hz pitch fluctuates around 10Hz while a voice of 250Hz pitch fluctuates around 35Hz. These data depend on reading speed and vocal training. The data were arrived at using radio announcers speaking under natural conditions. According to Saito's research, the frequency fluctuations widen when the reading speed becomes higher, and the fluctuations may become narrower by special training. Generally the frequency fluctuations of the female voice are wider than that of the male voice. In short, the fluctuations around 10Hz at 100Hz pitch with 10Hz fluctuations may bring about 10Hz brain waves. But the author speculates that such a connection is possible and understands why the special training in sophrology is so emphasized. It takes training to bring about the state of "sophronisation," or altered state of consciousness (Bancroft, 1979).

In a paper presented at the 1984 SALT Conference, the author noted the importance of $1/f$ fluctuations (Seki, 1984). At that time, he explained why, theoretically, the sound of $1/f$ fluctuations makes us feel comfortable and create a relaxed state. Voss has composed three kinds of computer music by white noise, $1/f$ noise, and $1/f^2$ noise, and found that music composed from $1/f$ noise was most agreeable to the listeners (Voss, 1978). Steven Halpern (1976), the composer of "Spectrum Suite," said that 95% of the listeners reported a significant increase in relaxation, a fact confirmed by Kirlian photographic analysis. According to our computer analysis of "Spectrum Suite," the part of Keynote G(Blue) was most close to $1/f$ fluctuations in the medium band frequency range ($6.25 \times 10^{-2} - 0.5\text{Hz}$) (Seki, 1984).

More recently, Robert Monroe published the sound tape called Hemi-Sync (short for hemispheric synchronization) (Monroe, 1985). He says:

When separate sound pulses are sent to each ear, using headphones to isolate one ear from the other, the halves of the brain must act in unison to "hear" a third signal, which is the difference (25Hz) between the two signals (100 and 125Hz) in each ear (Monroe, 1985).

He adds: "As a learning tool, it has a great ability to focus and hold attention." His book shows many actual examples of its effectiveness.

The author has tried to find out the underlying principle, but has yet to attain the final goal. In the meantime, very hopeful experimental research about the brain has been carried out at Hokkaido University in Sapporo, Japan.

Pinpointing the Auditorily-Evoked Dipoles in the Brain

Y. Isobe, Y. Mizutani and S. Kuriki have measured a very weak magnetic field all around the head surface using SQUID, giving the pure tones from one of the subject's ears and then located the apparent position as well as direction of the auditorily-evoked dipole by computer analyses (Isobe et al., 1987). A pure 1kHz tone of 800ms duration with 3 second periods of 1kHz tone of 200ms duration with random periods (1.5-2.5 sec.) was given to one of the subject's ears. To avoid the magnetic field effect of the earphones on the SQUID data, the tone was projected to the earpieces by a vinyl tube 3-5m long.

When the pure tone was given to the left ear of the subject, an apparent dipole moment of 20-30 (nA-m) appeared at the right hemisphere, while when it was given at the right ear, the dipole moment of 4-12(nA-m) appeared in the left hemisphere. Generally speaking, the dipole moment formed in the right hemisphere was about three times stronger than that formed in the left hemisphere. Not only did the instantaneous magnetic field intensity vary, but its direction changed from negative to positive and it lasted about 500ms after the disappearance of the signal. At the same time, field vectors were measured at a number of points on the head surface so as to draw a contour map. The maximum field intensity was about 700 (fT) ($=7 \times 10^{-13}$ Tesla or $=7 \times 10^{-9}$ Gauss), which is still very weak when compared with the earth's magnetic field pulsation (about 10^{-9} to 10^{-7} Tesla). The electromagnetic shield turned out to be absolutely necessary for these measurements.

Possible Mechanism of Brain Wave Control

The author has two questions about the concerns introduced in the previous section. The first question concerns the generated dipole. Does it have a concrete shape or is it an apparent one so that the dipole is not actually existing? The second point is whether the dipole is radiating the same frequency signals as the aural tone. These two points may be very hard to confirm by experiment. However, it might be clear that the auditory signals from one ear affect the opposite hemisphere.

If the exciting tone frequency becomes as low as 100Hz, the second question seems unnecessary. As was quoted before, Monroe (1985) has shown an example of low frequencies at 100 and 125Hz. In

such cases, the resulting dipole may be oscillating at the same frequencies as the exciting tone. He says that these signals are composed of sound pulses instead of sine waves. Assuming the flow of the currents in the neurons to be with fundamental frequencies of 100 or 125Hz, then the mixing of the two frequencies occurs inevitably at some nerve network in the brain. Furthermore, as the Weber-Fechner law shows, the stimulus-sensation relation is not linear. The sine waves will be distorted and the resulting signals will have to have different frequencies than 25Hz. This frequency can be lowered by choosing proper stimulating sounds. Thus the brain waves may be transformed from beta to alpha and alpha to theta etc.

Our Own Experiments

We have conducted a series of experiments under the foregoing principle. Two kinds of sine wave frequency signals were recorded on the stereo tapes as follows:

These tapes were not successful because the subjects who listened to these sounds felt disagreeable. The brain waves did not show expected modes, but the potential variations at the acupuncture points at the fingertip showed clear change (Professor Sasaki's report). Considering this experience, we have prepared the following tapes:

I have tried to listen to these sounds carefully and can only make the following comments. An ASC (Altered State of Consciousness) has been brought about after listening to these sounds and it was necessary to listen to allegro music in order to recover the ordinary state of consciousness. An additional experience involved a feeling state, and appeared to be the after

No.	Brain Waves	Side	Time Duration				
			15 sec.	15 sec.	15 sec.	15 sec.	5 min.
I	θ	L	154 Hz		154 Hz		154 Hz
		R		150 Hz		150 Hz	150
II	A	L	208		208		208
		R		200		200	200

effect of very high pitched reverberative sounds similar to tinnitus. This occurred soon after the pause of tapes II to VI. But such an effect did not occur after tapes VII and VIII. This phenomenon seemed to reflect my own subjective feelings. If the same phenomenon occurs with another subject, the author may venture to say that this may be due to the difference in sound frequencies (the frequencies of tapes III to VII are lower than 114Hz, while those of the latter group are higher than 500Hz).

Some Remarks About the Tapes

The author would like to express some opinions about the practical application of stereo sound tapes for the SALT class or for self-learning (called ASC tape for the sake of simplicity).

			Time Duration				
No.	Brain Waves	Side	15 sec.	15 sec.	15 sec.	15 sec.	5 min.
III	A	L	100 Hz		100 Hz		100 Hz
		R		92 Hz		92 Hz	92
IV	A	L	108		108		108
		R		100		100	100
V	θ	L	100		100		100
		R		96		96	96
VI	B	L	114		114		114
		R		100		100	100
VII	B	L	1014		1014		1014
		R		1000		1000	1000
VIII	θ	L	504		504		504
		R		500		500	500

1. The author would like to recommend earphones to hear the ASC tape. Stereo speakers may reduce the effect when compared to the use of earphones, because the two sounds will be mixed at the ears before going into the nerve networks in the brain.
2. As the frequency response at frequencies lower than 100Hz of regular tapes usually shows degradation, the amplitude of sine wave signals will be reduced in each dubbing. This is very inconvenient for practical application by many users. To solve this problem, it might be better to use 100Hz pulses instead of 100Hz sine waves.
3. If the pulse signal recording is successful, why not use an 8Hz pulse recording instead of 100/108Hz stereo signal recording? Of course, the effectiveness and the feeling by the students may create new problems. Perhaps the individual headphones may be replaced by the stereo speakers. This is an area for future research.
4. The discrepancy of the double tracks in stereo recording and playing heads is a vital problem where coincidence of the two heads is absolutely necessary. We have to choose a proper recorder/player system.
5. It seems that the continuous aural stimulating brings boredom on the side of the students and the proper duration of it is considered to be necessary. The allocation of stimulating time and pause seems important. For example, excitation and pause may be repeated as synchronized with the breathing cycle. The following allocation is just an example: 2.5 sec. ASC stereo sounds; 2.5 sec. 1/f noise; 5 sec. pause.

Much research remains to be completed in this new and exciting field.

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La formation des ondes alpha dans le cerveau grâce aux son stéréos à ondes sinusoïdales. (Seki)

Cet article apporte des considérations à la fois théoriques et pratiques sur la formation des ondes Alpha

dans le cerveau grâce à des stimulants sonores. L'auteur présente d'abord les mesures du champ magnétique cervical qui furent faites à l'université de Hokkaido (pas par lui-même, résultats sur lesquels il s'appuie pour donner une explication théorique de l'enregistrement de la synchronisation des hémisphères (Hemi Sync) de Monroe. L'université de Hokkaido a obtenu cette série en utilisant des mesures crâniennes SQUID, mesures de la stimulation d'un son pur vers une oreille du sujet, induisant un courant dipole dans l'hémisphère opposé du cerveau. L'enregistrement Hemi Sync est un enregistrement à son stéréo avec deux fréquences, par exemple 100 et 125 Hz, ce qui peut induire 25 Hz dans le cerveau du sujet. En fait, l'auteur a essayé des fréquences de 100/108 Hz et de 100/104 Hz pour induire des ondes cervicales alpha ou thêta. L'auteur examine la raison théorique qui fait que les ondes du cerveau changent selon les différentes fréquences et attribue ces modifications à la non-linéarité du système nerveux dans le cerveau. Après écoute des enregistrements, il suggère plusieurs choses pour les améliorer et recommande quelques méthodes d'applications pratiques pour SALT.

Alpha Gehirnwellenformation durch Sinuswellenstereoklänge

Diese Studie handelt von theoretisch und praktisch betrachteter georinduzierter Alpha Gehirnwellenformation. Die Verfasser führte zunächst die magnetischen Feldmessungen um das Gehirn ein, welche an der Hokkaido Universität (nicht beim derzeitigen Verfasser) unternommen wurden, deren Ergebnisse vom derzeitigen Verfasser zur theoretischen Erklärung des Hemi Sync Tonbandes von Monroe benutzt wurden. Die alte Serie soll mittels Superconductin Quantum Interference Device (SQUID) Messungen um den Kopf unternommen worden sein,

unter reiner Tonanregung eines Ohres des Untersuchten, welche Dipolströme in die gegenüberliegende Gehirnhemisphäre induzieren. Die Aufnahme des Hemi Sync Bandes ist ein Stereoklangband mit zwei Frequenzen, z.B. 100 und 125 Hz, welche 25 Hz in das Gehirn des untersuchten leiten. Der Verfasser hat tatsächlich 100/108Hz und 100/104 Frequenz-Sterobänder probiert um alpha oder theta Gehirnwellen zu induzieren.

Der Verfasser erwog den theoretischen Grund für Gehirnwellenwechsel durch unterschiedliche Frequenzen und er ordnete diese der Nichtlinearität des Nervensystems im Gehirn zu.

Nach Anhören dieser Bänder schlug er verschiedene Verbesserungen für die Klangbänder vor und empfahl einige praktische Anwendungsmethoden an SALT.

Formación de la onda cerebral alpha por los sonidos esteros de la onda sine

Este trabajo trata con la formación de la onda cerebral alpha a través de medios orales, ambos considerados teoretica y practicamente. El autor introduce primero las dimensiones del campo magnetico existentes alrededor del cerebro, realizados en la Universidad de Hokkaido (no por el presente autor). Dichos resultados fueron usados por el presente autor para la explicación teoretica de la cinta de Monroe's Hemi Sync. Las series anteriores se han atribuido a "Superconducting Quantum Interference Device" (SQUID), dimensiones alrededor de la cabeza bajo una pura estimulación del tono en el oído del sujeto la cual inducia a una fluida diploridad en el hemisferio opuesto del cerebro. La grabación de la cinta Hemi Sync. es una cinta de sonido estereo con dos frecuencias, por ejemplo, 100 y 125Hz, las cuales pueden producir 25Hz en el cerebro del individuo. En realidad, el autor lo ha intentado con cintas de frecuencia 100/108Hz y 100/104Hz para inducir ondas alpha o theta en el cerebro.

El autor considera una razón teórica en los cambios de onda del cerebro con diferentes frecuencias y las atribuyó a la no-linearidad del sistema nervioso en el cerebro. Después de haber oído estas cintas, sugirió algunas mejoras en el sonido de las cintas y recomendó la aplicación de algunos métodos prácticos a SALT.

Implementing Whole-Brain Methods for Reading Instruction

Ann Arnaud Walker

Abstract. This paper reports growth in reading comprehension of remedial junior high students, ages 12 to 14, who entered this project scoring three or more years below grade level. During the school years from 1984-87, three groups of pupils numbering 119, 142 and 129 were given daily instruction for 47 minutes by a two-teacher team. One of the teachers had received formal training in SALT and other integrative methods. Instruction utilized SALT strategies, Neural-Linguistic Programming and other wholistic techniques. Reading comprehension was measured each September and June using the Stanford Achievement Test. There were no control groups. The average grade level growth in each of the three years was more than 200 percent of the normal rate. Comparison of project and pre-project yearly gains show acceleration rates of 493, 336, and 285 percent. The greatest growth, both in grade level and in percent of acceleration, occurred in the first year.

* * * * *

This is the story of a search for methods to help junior high remedial reading students achieve academically. The cast of characters includes the yearly crop of 180-195 remedial reading students at Sunnyvale Junior High in Sunnyvale, California, my teaching partner, myself, and many people who helped us along the way.

The saga began in the fall of 1983 and extended for four school years, ending in June, 1987.

Our groups of seventh and eighth grade pupils were highly diversified, except for one fact. When we began, all of them tested three or more years below grade level in reading comprehension. Some were hardworking and motivated; most seemed to have lost interest and given up. Some were learning English as a second language. Around forty of them were in some type of resource class part of the day. The home environments of some pupils appeared extremely stressed, but others apparently were not. Parents tended not to be involved in the life of the school. Even after receiving personal invitations to Back-to-School Night each fall, only 14 to 20 attended. Yet when we contacted parents individually, we usually found that they were deeply concerned about the progress of their children.

Each year some of our pupils scornfully said that they did not belong in our classes because they could read. This conclusion seemed logical to them, for they could, indeed, usually decode words with relative ease. But there was one big problem. Generally, these word-callers had not the foggiest idea of the meaning of what they had "read." Still, they considered themselves readers and were puzzled, and often angered, by their low scores on comprehension tests.

Regardless of the reasons for our students' deficiencies, the task in the fall of 1983 was to design a remedial reading program to meet the diverse needs of this population. During the three prior years, I had studied the emerging research on the brain and the resultant educational applications, particularly suggestology as set forth by Dr. Georgi Lozanov (1979). This

path was taken with a small group of colleagues under the leadership of Dr. Frances Ridley, who was then a principal in Sunnysvale. (That group has incorporated suggestopedic strategies into their classes. The name applied locally is "SuperLearning," after the name of Ostrander's book (1979) or "Total Accelerated Learning.") In my pursuit of knowledge, I read, visited projects such as Jean Taylor's classes in Georgia, took workshops from Ivan Barzakov and others, and tried out some of the new techniques with students in grades one through eight. I was in Iowa for the annual SALT Conference and Don Schuster's workshop on suggestopedic teaching methods when called about this new assignment to teach remedial readers. Administrators gave support for use of the whole-brain approaches I was eager to implement. Although my teaching partner, Virginia Gonzales, had no previous training in these procedures, she also was agreeable.

Thus, we began our new project in September 1983. We met nearly 200 students daily, divided into six 47-minute classes of mixed 7th and 8th graders. My discussion of our program will fall into three main categories: 1) Emotional Climate, 2) Physical Environment, and 3) Materials and Instruction, followed by a brief survey of the results which we achieved and consideration of what we learned.

Emotional Climate

We believed that our students were capable of achieving at, or above, grade level in reading. We attempted to transmit our high expectations in a setting where learners felt safe and secure. When a student entered the room acting hostile, withdrawn, or otherwise disturbed, one of the teachers would confer privately with him/her to offer help. We tried to maintain a warm, accepting tone.

Most instruction was done with the whole class, but we held frequent individual conferences with students to discuss progress and set goals. Pupils were not called on in class until they volunteered to participate.

We told our students that they had not fallen behind due to a lack of intelligence or effort, but rather because they probably learned in a different, more global way. We told them that we were prepared to meet their special learning modes. We encouraged them to expect progress, while also taking care not to make extravagant promises which could destroy our credibility. We used indirect suggestion, such as "Sooner or later, this will be easier for you" and others from Prichard and Taylor (1980). We reminded students that advancement might be sporadic. We told them that their growth was similar to an ocean voyage: Sometimes waves would toss them high, sometimes low, but always they were moving toward their destination.

During the second year, we began charting the percentage of homework returned on the day it was due. At the end of each quarter, the class with the highest average enjoyed a student-planned party. Before this incentive was offered, it was not unusual to hear a motivated student taunted by classmates as a "school boy" or "school girl." Our plan helped move peer pressure to the positive side. Students were invited to stop in our room before and after school or during brunch for needed materials and help with reading or other subjects. Most pupils eventually realized that we wanted them to achieve our high expectations.

Physical Environment

Our classroom and a nearby area used occasionally for small groups were sprinkled with positive slogans.

the most prominent being "YES, I CAN !" in two-foot letters above the chalkboard in the front of the room. Bulletin boards also reflected the philosophy of our approach. One of them summarized our unit on the vast potential of the brain. Another depicted the power of imagery to enhance comprehension and memory.

A collection of hats hung near a group of puppets. We used these props to dramatize vocabulary words or stories. A "Creation Location" held art and writing materials for students who wished to share impressions or information about a book they had read. Products of such sharing were displayed close by. Art prints, student art, and numerous growing plants contributed to the decor. Light pink, warm rose, and shades of blue dominated the color scheme. When possible, a bouquet of fresh flowers provided a focal point for the room. Some of the fluorescent lighting tubes were removed in order to create a more restful, subdued atmosphere. Classical, baroque, and other soothing music was played daily, either as a formal part of instruction or as background for activities such as silent reading.

Materials and Instruction

Our basic materials were paperback editions of novels by Steinbeck, Collier, O'Dell, and other authors. We chose stories at least two grade levels above the average reading ability of the class. In addition, we often read selections from *Scope* magazine and newspapers. A few times each year, we used science or social studies textbooks for practice in understanding non-fiction material. Much of our reading was done chorally by the entire class. Students guided their eyes with a marker above the line and read aloud, matching the teacher's pace. Sometimes the teacher read to the students as they followed silently. Each session was pre-

ceded by a quick review accomplished through a guided imagery, clustering (Rico, 1983), or discussion. Expectations, usually in the form of questions, were set before books were opened. We stopped frequently to discuss the imagery evoked by the words. Occasionally the teachers or volunteer students acted out what had just been read.

A formal process for vocabulary development was an important part of our program. For each unit, teachers drew a list of 30 words from literature which would be read in class several weeks hence. These words were printed on cards and placed above the board at the front of the room. The instructional cycle, based on the suggestopedic model (Schuster, et al., 1976), was then carried out in the following steps.

First, a global presentation was made in which teachers used all 30 words in a skit, a story, or an interview. No effort was made to explain the meaning of the words; they were simply used in context in a show which students watched and enjoyed.

Second, each student was given a handout with each word listed, defined, and used in a sentence. Then students followed silently as the teacher read this paper, accompanied by an appropriate classical selection. This reading, called Concert Reading A, was quite dramatic and included the teacher's acting out the word meanings when feasible. The teacher's voice "surfied with the music," loud or soft to match its qualities. Students were instructed to make an image showing the word's meaning during the pauses between each segment of the reading.

The third step of the vocabulary cycle, done on a later day, began with physical relaxation. As soft music

played, students were led through a brief progression of tensing and relaxing of muscles, head to foot, and a few rounds of slow, deep breathing. They then assumed a relaxed, comfortable position, free to place their heads on the desks with eyes either open or shut. A teacher then guided the class through an imagery to a restful location, perhaps a beach, a forest, a flower garden, or a meadow. When the pupils were in an alert, relaxed state, they were asked to re-create through imagery an earlier successful experience. Emphasis was placed on use of all five senses--seeing, hearing, touching/feeling, tasting and smelling. As students remained relaxed, the music changed to a baroque selection for Concert Reading B. Instructions were given to "just concentrate on the music; don't make images." Next the teacher read in an even voice tone each vocabulary word and its definition to four beats, followed by a pause for four beats. Finally, she invited students to notice the deep quietness of the room and the pleasant ease of learning while relaxing, ending with positive comments regarding future success and enjoyment of reading and other academic activities.

Next, the vocabulary cycle moved into the practice/activation stage, much of which was done as homework. Students wrote stories or sentences using the vocabulary words, drew scenes or pictures depicting definitions of the words, filled in blanks in a teacher-written narrative of the scenario which had constituted the initial global presentation. We rotated synonym and antonym exercises, charades with or without puppets, clapping or moving to the rhythm of the word, and bingo games during this active stage. The final step in the unit was a test in which students wrote the correct vocabulary word next to its definition.

Some students needed help with the pronunciation of certain vocabulary words. An auditory-visual integration strategy for sight word recall from (Neuro-Linguistic Programming, Bandler and Grinder, 1975) proved useful. After printing the words on separate cards, the teacher proceeded through the following steps which utilize the natural patterns for processing language. First, the teacher holds a card in a high position to the left of the class and says the word in a high, fast voice to stimulate imagery (visual imagery mode). Second, the teacher lowers the card to mid-body and repeats the word in a lower tone (auditory memory mode). Third, the teacher moves to a position to the right of the students and the class joins the teacher in saying the word (auditory construct mode). Fourth, the teacher lowers the card and, with chin almost touching the chest, slowly enunciates word before the students say it with her (kinesthetic mode). Step Four was needed only if the class garbled the pronunciation at Step Three. We found this integration strategy helpful, especially for students who had been diagnosed as dyslexic. It helped the learner to remember, when he saw a word, how it sounded and, when he heard a word, how it looked. Incidentally, by utilizing only the visual memory part of this cycle, we successfully tutored several pupils who were getting failing spelling grades in their Language Arts class. Some learners were creative in applying this technique to other tasks. One boy landed a job at a restaurant by memorizing in one day the ingredient formulas for each of the numerous sandwiches on the menu.

We considered the ability to image as the basis of comprehension. The Mind's Eye program (Title IV-C, Escondido CA, 1979) provided useful strategies for development of this skill. During a series of lessons, students learned to pick out the key words (those which carry the heart of the meaning) in a selection.

Then they practiced imaging the scenes, followed by discussion and dramatization. Students learned that if an author did not provide details, they were each free to construct their own pictures. They also noticed that many words are adjunctive, and it became easier for most of them to take in phrases rather than single words. The next natural step seemed to be faster reading. Certainly we were not attempting speed reading, rather just an awareness that one can move faster and still comprehend. Many of our pupils who had habitually read one word at a time found most material was more meaningful and interesting when they read faster. We characterized this change as the difference between watching a boring slide show and a lively movie. We found that attention to key words also helped students understand written directions, perceive the thrust of written questions, and decipher context clues.

Another technique, picture-noting, reinforced the notion that reading creates images in the mind. First we drew a grid of squares on the board. Then after reading a passage, we stopped and a volunteer made a quick sketch of the action. As reading proceeded, students became proficient at recognizing transitions requiring the drawing of a new scene. The last step was the retelling of the entire story, using the picture notes as prompts. At this time pupils elaborated such submodalities as size, color, shape, distance, volume, pitch, location, etc.

As a further aid to comprehension, we introduced Buzan's mindmapping (1979). Many students who would have found it difficult, if not impossible, to make a linear outline, discovered that they could use this graphic method for organizing material. However, after we taught Rico's clustering technique (Rico, 1983), most

pupils preferred it. They liked allowing their free flow of ideas to pop out onto the page. In fact, they often called the process "popcorning." They kept a journal in which they periodically clustered themes from the literature being read. These clusters mingled personal experiences and feelings with information and impressions from the book. Using their clusters to discover the patterns, connections and deeper meanings, pupils then wrote a short paragraph on the adjacent journal page. Teachers read these clusters and essays and responded with a few accepting, reflective sentences. This procedure from Rico facilitated introspection, bridged the literature to the students' lives, and provided an opportunity for an open, trusting dialog between pupil and teacher. Students felt a sense of personal enrichment from this procedure which seemed to increase their interest in reading.

We actively prepared our seventh graders for the district-wide standardized tests. Students told us that they often had felt so overwhelmed during this traumatic ordeal that they had just randomly marked answers. In order to empower them with a sense of control, we led them through a step-by-step mental rehearsal of the testing experience. We pointed out that numerous amateur and professional athletes also use imagery to enhance their performances. (Some of our students, too, eventually did this on their own!) With students in an alert, relaxed state and quiet music playing, we recited everything the student was to do from the time of entry to the testing room: relaxing physically and breathing deeply as the test booklets were passed, reading and imaging of the test selections with emphasis on key words, reading of questions noting key words, and then properly marking the answer sheet. Students were instructed to image themselves performing each step easily and efficiently. We were

not present, since in our district, these tests were administered in another class. Thus it was critical that students felt sure of their ability to focus themselves independently. We repeated this mental practice two or three times during the week before testing. We wanted our students to feel confident and calm enough to demonstrate what they actually knew. We wanted them to break the old patterns of defeatism, and build self-esteem which sprang from academic performance.

Finally, a vital part of our system was daily silent reading. While soft music played, pupils read fiction which they checked out during regular visits to the school library. Before books were opened, readers were encouraged to recreate in their minds the last scene read. As reading began, we suggested that the brain would become very active as it formed "movies" from the words on the page. One student caught our meaning when she wrote, "I felt my neurons dance when Mrs. Walker turned on the music." Teachers circulated to assist with the use of markers and pacing, to discuss imagery and meaning (briefly, in soft whispers), and to enjoy as many of the stories as possible with the students. We employed the NLP strategy of "anchoring" by giving a light, brushing touch to the shoulders or hands of deeply absorbed readers. As the session ended, teachers suggested a metaphor related to television or VCRs to help students "freeze" the action and recall it at the next reading.

To summarize, our literature-based curriculum presented rather large amounts of material well above the testing average of our classes. Yet students often mentioned, or even complained, that the work was "too easy." We placed an emphasis on HOW to learn. We used a wide variety of whole-brain strategies which tapped our students' vast potential to comprehend bet-

ter, remember more, organize information, and make personal use of what was learned.

Results

We did no formal research during the four years of this program. However, we kept records of the distribution of scores on the vocabulary tests. We also have results from reading comprehension tests given during the second, third and fourth years. The test used was an obsolete edition of the Stanford Achievement Test, which we administered in our room each September, February, and June. This process provided a frequent check on growth, as well as valuable experience for our students with the stringent conditions of standardized testing.

Our data show that approximately 45 percent of the students scored a perfect paper on the unit tests of 30 vocabulary words. Another 25 percent missed only one or two words. Scores remained almost as high on periodic review tests, a fact which boosted the students' faith in our methods.

Table 1 shows the average grade level of comprehension scores and the average grade level growth in each of the three years for which we have data. (None is available for the first year of the program.) We had a rather transient population. While our enrollment fluctuated around 190, only those students who were with us for an entire year are included in this compilation.

Table 2 presents the rate of acceleration in this program. Since our classes consisted of seventh and eighth graders, each entering group had experienced an average of six and one half years of instruction. Therefore, 6.5 was used in computations of the prior average yearly growth.

Table 1: Reading comprehension on Stanford
Achievement Test

Year	Number of Students	September Grade Level	June Grade Level	Change
1984-85	119	3.56	5.88	+2.66
1985-86	142	4.35	6.60	+2.25
1986-87	129	4.89	6.91	+2.02

Table 2: Percentage of acceleration

Year	September Grd. Level	Growth Each Prev. Year	Growth This year	% of Acceler.
1984-85	3.56	.54	2.66	484
1985-86	4.35	.67	2.25	336
1986-87	4.89	.71	2.02	285

What did we learn? First of all, the rate of learning did accelerate during this program. At the same time, we realize and acknowledge that we merely added our efforts to those of other staff who also taught these students each day. Some pupils, particularly those who were learning English as a second language, could probably have been expected to show accelerated growth as their facility in English increased.

Gains and rate of acceleration in this project seem consistent with results reported by Palmer (1985),

especially those of Prichard and Taylor (1980), who are among the few who also dealt with junior high reading. Our project apparently included a broader range of whole-brain tactics and a larger population than any of those in Palmer's analysis.

Since no formal research was done on our program, obviously no comparisons can be made to control groups. We note that our growth scores and rate of acceleration moved downward each year, while the comprehension grade level grew steadily higher each September. The latter fact was true because, happily, the seventh graders entered with increasingly higher scores. Also, since our classes were mixed seventh and eighth graders, a sizeable number of our group were carry-over students who had made significant growth during their seventh grade year with us. Their presence the next fall also skewed our beginning averages upward. The unanswered, interesting question is why the yearly grade level growth moved consistently downward, although still reflecting in the last year a 285 percent acceleration over previous yearly average gain.

Finally, numerical data presented only a part of the picture we saw. They do not tell the story of the rising confidence which we detected in most of our pupils. This observation was borne out by the results of a survey conducted in our classes in June, 1986. Only eight percent felt that whole-brain methods were not helpful in making learning easier. Our students' resurgence of pleasure in reading and their higher confidence and sense of self-empowerment were our greatest rewards. Contrasted with our past experience using more traditional instruction, whole-brain approaches seem to offer new and exciting hope for learners.

* * * * *

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* * * * *

La Mise-en-Oeuvre de Méthodes se Concernant avec tout le Cerveau pour l'Enseignement de la Lecture.

Cette dissertation rapporte une augmentation dans la compréhension de la lecture de collégiens de classes de perfectionnements, âgés de 12 à 14 ans, qui ont com-

mencé ce projet avec un niveau de deux à trois ans au-dessous de leur classe. Pendant les années scolaires de 1984-87, trois groupes comptant 119, 142 et 129 élèves reçurent un enseignement quotidien de 47 minutes donné par une équipe de deux professeurs. Un des professeurs avaient une formation dans les stratégies de "SALT" et dans d'autres méthodes d'intégration. L'enseignement a utilisé les stratégies de "SALT," la programmation neuro-linguistique, et d'autres méthodes qui tiennent compte de l'ensemble. La compréhension de la lecture a été mesurée chaque septembre et chaque juin utilisant le "Stanford Achievement Test." Il n'y avait pas de groupe contrôle. La croissance moyenne du niveau pendant chaque année des trois ans était plus de 200 pourcent du taux normal. Une comparaison des gains pendant et avant le projet montre des taux d'accélération de 493, 336 et 285 pourcent. La plus grande augmentation, à la fois dans le niveau et dans le pourcentage d'accélération, a eu lieu dans la première année.

Die Einführung von 'Ganz-Gehirn' Methoden beim Leseunterricht.

Dieser Bericht informiert über das gesteigerte Verstehen beim Lesen im Nachhilfeunterricht bei 12-14 jährigen 'Junior High School' Schülern, die am Anfang dieses Projektes drei oder mehr Jahre unter dem Niveau dieser Klassenstufe standen. Während der Schuljahre 1984-87 wurden 3 Gruppen von je 119, 142 und 129 Schülern täglich 47 Minuten von einem 2-Lehrer Team unterrichtet. Einer der Lehrer hatte eine Ausbildung durch SALT und mit anderen integrierenden Methoden. Die Lehrmethode beinhaltete SALT Strategien, Neural-Linguistische Programmierung und andere Ganzheitstechniken. Das Leseverständnis wurde jeden September und Juni an Hand des Stanford Leistungstests ausgewertet. Es gab keine Kontrollgruppen. Der Wachstumsgrad für jedes

Schuljahr betrug mehr als 200% der normalen Wachstumsrate. Der Wachstumsvergleich der Fähigkeit der Kinder vor und nach dem Projekt zeigten jährliche Wachstumsraten von 493, 336 und 285%. Die größte Wachstumsrate auf der Schuljahrebene und im Prozentsatz der Beschleunigung in Bezug auf Fortschritt, ereignete sich im ersten Jahr.

Realización de los Métodos "Whole Brain" para la enseñanza de Lecturas

Este artículo informa acerca del crecimiento en la comprensión de lectura de los estudiantes problemáticos del nivel "junior high," de edades entre 12 y 14 años que entraron a formar parte de este proyecto debido a su bajo nivel que estaba tres o más años por debajo del de sus compañeros de curso. Durante los cursos académicos del 1984 al 87 tres grupos de alumnos numerados por el 119, el 142 y el 129 recibían clases diarias de 47 m. por un equipo formado por 2 profesores. Uno de ellos, había recibido entrenamientos en SALT y en otros métodos integrativos. En su docencia utilizaba las enseñanzas de SALT, programación lingüístico-neural y otras técnicas integrativas. La comprensión de lectura se medía cada septiembre y cada junio utilizando el "Stanford Achievement Test." No existían grupos de control. El nivel medio de crecimiento en cada uno de los 3 años fue de más de un 200 por ciento de la media normal. La comparación anual del proyecto y del pre-proyecto muestra una media de aceleración del 493, 330 y 285 por ciento. El mayor crecimiento, tanto en el nivel de curso como en la aceleración del porcentaje, tuvo lugar durante el primer año.

BOOK REVIEW

Legal Issues in Special Education by Stephen B. Thomas, NOLPE, Topeka, Kansas 1985, pp. 72 Reviewed by Earl J. Ogletree

In the past ten years, special education law has emerged as a distinct legal area. Special Education students are not only protected by the broad constitutional provisions provided other students, but by a myriad of specific statutes, regulations and judicial decisions. Consequently educators are obligated to follow and implement these laws, "which have neither been fully explained..." nor understood. During this period volumes of material on the handicapped has been published.

This succinct volume abridges and provides an overview of and "the basics" in special education. The booklet is divided into six sections: 1) history and constitutional and statutory laws, 2) procedures for providing a free and appropriate public education, 3) student records, 4) discipline of special education students, 5) minimum competency testing, and 6) physical education and sports participation.

The author interprets and illustrates the application of equal protection and due process clauses of the 14th amendment, the Rehabilitation Act of 1973 and the Education of the Handicapped Act of 1973 for handicapped persons. Included are numerous supportive illustrative special education cases. Thomas provides a succinct summary of Free Appropriate Public Education (FAPE): "Federal courts require educators to involve parents in the decision-making process--implicitly meet the identification, evaluation, Individual Education Program

(IPE) document, placement and due process requirement of the Education Handicapped Act (EHA)." This includes providing each handicapped child a FAPE with some educational benefit. However, neither an equal educational opportunity nor a maximum level of education is mandated, nor a "best" education possible for resident handicapped children. These decisions have been upheld by the courts against the appeals of parents, unless such decisions are shown to be arbitrary.

In regards to student records, EHA regulations have adopted many of the requirements the Buckley (1974) Amendment (Family Education Rights and Privacy Act). School boards must adopt a written policy consistent with FERPA, and the agency may not charge a fee to search for or retrieve information, or charge for copies if such payment effectively prevents the parents from inspecting and reviewing those records.

School officials may employ suspension, expulsion, transfer, in-school suspension and withdrawal from extracurricular activities to discipline handicapped students. In addition to the Goss vs. Lopez (1975) guidelines, EHA guidelines need to be considered or strictly followed. The courts have agreed that a temporary suspension (less than 10 days) is not a change of placement; a formal hearing is not warranted; dangerous or disruptive students may be temporarily suspended prior to a formal expulsion hearing or prior to a more restrictive placement; a disciplinarian, not necessarily the placement committee, may determine whether the suspension is warranted; in emergency situations, the disciplinarian need not determine whether the misconduct was handicap-related; and indefinite or more than ten day suspensions are not permitted unless a formal due process hearing is held (one that exceeds the Goss requirements). However, whether educational services

outlined in the IEP must be followed during the suspension period has not been clarified by the courts.

Although the procedures are more demanding for expulsion, nevertheless, litigation has been more numerous than for the suspension of handicapped students. The review of judicial decisions shows that courts have ruled: 1) an expulsion is a change of placement and must be administered according to section 1415 procedures; expulsion is theoretically possible under federal statutes, but a school must prove that disruptive behavior was not handicap-related, and that the student was appropriately placed at the time of the disruption; determinations of appropriate placement and handicap-relatedness of the behavior must be made by qualified persons and not by disciplinarians; and services may not totally be withdrawn during a legitimate expulsion. However, the courts have not clarified the level of services required during an expulsion. Theoretically, a handicapped child may be expelled, but unlikely in practice. Although expulsion is judicially possible, current trends show that most students are placed in a more restrictive, or different environment or transferred to a substantially similar program within the school district. Any transfer to different or similar environment is best made by the placement committee, rather than a disciplinarian.

In-school suspension has been acceptable to the courts so long as it does not exceed ten days or is not used excessively, or that the student is not routinely removed from his IEP for his behavior that is handicap-related, which would require an appropriate hearing.

Special education students may legally be withdrawn from extracurricular activities if they are not discriminatingly treated or the experience is not part of their respective IEPs.

Minimum competency testing (MCT) has been a widely litigated issue. States have plenary power to use minimum competency tests (MCT) to identify students with academic needs and to regulate the merit awarding of high school diplomas. All students have the right to take tests to meet the requirements for diplomas. Although the tests can be modified, school districts are not required to set separate standards or prepare individualized examinations for the handicapped or students in special need. Although handicapped students may receive less academic content than their non-handicapped peers, the courts have not found the practice violative of the equal protection clause of the 14th Amendment or section 504 of the Rehabilitation Act.

Thomas recommends that parents should become fully involved in their child's IEP, become aware of the general content, administration and purpose of the MCT and attempt to include MCT content in that child's IEP.

The final legal issue is the participation of handicapped students in physical education and sports. The courts have sustained the routine inclusion of physical education in a student's IEP, but not when it has been limited or omitted.

Case law on the right to participate in non-IEP physical education or sports programs is unsettled as compared to IEP activities. A qualified handicapped student who meets all the requirements of an activity may not be denied the opportunity to participate. He could be denied based on skill, ability, age, residency, Grade Point Average (GPA) and other factors. Where there are conflicting athletic association policies or state statutes, or an injury-risk to others, a special education student may not be allowed to participate. The burden of proof is on the student to rebut the policy or position of the agency or school district.

The author is to be commended for condensing so much information and so many legal principles on special education into this small volume. In spite of its size, *Legal Issues in Special Education* is comprehensive, readable and interesting. Thomas provides summaries and conclusions at the end of each chapter, a table of cases, and an index which makes it an excellent reference work. The text should be in the library or on the desk of administrators, teachers, parents and attorneys who are involved or concerned with special education children and students.

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A Suggestopedia Program in Japan

Charles Adamson
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* * *

Abstract. This paper outlines the history and program at the Kawaijuku Institute of Suggestive-Accelerative Learning (KISAL), Trident College in Nagoya, Japan. Although not particularly well known, this successful program is now entering its ninth continuous year of operation. First, the gradual development of the program is traced. Then the current course and materials are described in some detail. The paper concludes with a brief discussion of the Institute's plans for the future.

Introduction

Although not yet widely appreciated in Japan, Suggestopedia is gradually gaining ground as an accepted teaching method. Trident College, a special training college (SEMMON-GAKKO) located in Nagoya, has the oldest continuing Suggestopedia program in Japan and has successfully made the method a part of the regular curriculum for the Trident School of Languages which offers two- and three-year programs for female high school graduates, consisting of "core" courses in English and additional courses in Business, Tourism, Cross-Cultural Studies, or English. Most of the graduates seek employment after graduation, but a few go on to further education, often at foreign universities.

History

The Suggestopedia program at Trident began in March, 1979, with the establishment of the Asian Institute of Suggestology (now the Kawaijuku Institute of Suggestive-Accelerative Learning). This event was preceded by a month-long teacher training session by Dr. Gabriel Racle. This course consisted of a demonstration French course and practice teaching of an English course by Kazunori Nozawa and the author.

During the remainder of 1979 a series of English courses was offered. Feedback from the students was very positive and encouraging. However, we felt that the materials could be better suited to our specific students. So, after one of our staff visited Bulgaria, we decided to develop our own program based on the specific needs of our students.

Over the next few years visits by Alison Miller, Donald Schuster, Michael Lawlor, Charles Schmid, and others gradually added to our base of knowledge. We successfully experimented with a variety of class configurations, varying from three to fifteen hours a week. We also began a series of experiments to test various factors related to our program. The most important was a comparison of Superlearning, self-study, and teacher-based study as vehicles for learning French and English vocabulary. The results showed that the prestige of the person presenting the experiment to the students was the prime factor relating to success in memorization during our experiment. Based on these studies, Janis Hanson and I developed an original text for junior high school students, *A Year in America*, and had a number of highly successful courses before the program was eliminated by an administrative restructuring.

By expanding the elaboration time, we were able to increase the number of class hours enough to use the junior high school course as a part of the regular college program for the weakest sophomore students. Encouraged by our success with the college level students, we modified the elaboration activities and began to use the course with the highest level freshman students. At this level, it was obvious that the language in the text was much too basic for the students, so attempts were made to rewrite and expand the text. It was found that this was not feasible, so my collaborator, Christel Yoshizumi, and I began work on an entirely new text, *In for a Penny, In for a Pound*. We have now used this text for a full year and are entering the second.

The Honors Program

One of the sales points for Trident College is the Honors Course. This is a special two-year core English program for the very best students entering the School of Language. Regular students receive 12 hours a week of intensive English study, consisting of courses in listening, speaking, reading, and writing. The Honors Students have our Suggestopedia course during their first year and a series of content courses taught in English by English teachers during their second year. The content for these second year classes stresses inter-cultural communication and work focusing on specific aspects of Western culture. In the following paragraphs, I will discuss only the suggestopedic portion of the program since, except for the use of "Zen Breathing" at the beginning of each class, the second year courses are not taught with accelerative methods.

The Suggestopedia Course

This course for first year students with advanced standing meets for eight 90-minute classes a week. Its primary goal is the activation of the large quantities of language students memorized during their high school study. The standard class size is 40, but during four of the weekly meetings, the class is divided into two groups of 20 who meet separately with different teachers. These two teachers each teach two of the classes with 40 students, for a total of six classes per teacher. The class (40 students) meets in the school auditorium, which has moveable chairs and a lot of space. The groups (20 students) meet in special rooms. These rooms each have a stereo sound system, dark green carpeting on the floor, wallpaper (orange on one wall, off-white on the others), extra whiteboards, pictures hanging on the walls, and green plants on tables near the windows. All in all, the rooms are more like lounges than classrooms. The students begin the class sitting in moveable chairs which have arms and slightly reclining backs. There are no desks. When students need to write, they use clipboards which are stored in the room.

The students are graded in the same areas as the regular students: listening, speaking, reading and writing as well as the appropriateness of the linguistic functions that they use. Final examinations are given as well as weekly quizzes. Homework is assigned and some of it is graded.

The Text

The title of the text, *In for a Penny, in for a Pound*, comes from a quote by one of the main characters, Chifumi Kando, who says, "In for a penny, in for a pound," when she decides to join the adventure by whole-heartedly helping the other main character, Steve.

The plot is a love/adventure story that ends with Chifumi saving her boyfriend, whom she then finally agrees to marry and live with happily ever after. Of course, along the way, they have managed to become rich beyond their wildest dreams. The plot was deliberately designed to resemble the plots in the reading that the students do for pleasure. Feedback studies have verified that that story appeals to the students.

The book contains 28 chapters of about 1,000 words each, which allows the use of approximately one chapter per week of class. There was some attempt made to keep the vocabulary and syntax simple, particularly in the first few chapters, but otherwise it is uncontrolled. The natural unfolding of the English language in the context of the situations selected for each chapter insures that important vocabulary items and grammar appear and are repeated at natural frequencies. The book is printed in three volume, each containing the appropriate number of chapters for the length of the trimester. The story is written in the first person, so Chifumi Kando appears as the name of the author. Except for the fact that it is oversized, the book appears to be similar to American books rather than the typical Japanese book. Each chapter begins with the complete English text and this is followed by the translation. In a normal suggestopedic text, the main text is typed line by line in phrases with the translation to the right on the same line. Because our text is an advanced text containing longer sentences and the fact that the order of Japanese (subjective-object-verb) and English (subject, verb, object) are different, making it impossible to keep translations on the same line when the English sentence is long, we have developed a new method of presentation. The entire English sentence is printed and then on the line following it, the entire translation is printed, followed by vocabulary and/or cultural notes.

Autogenics

For each chapter of the text we have an accompanying autogenics exercise. We have slightly modified the formulas given in Ostrander and Schroeder (1979) to fit our schedule. It takes about five to seven minutes at the beginning of each and every class session.

The Concert Sessions

Because our course is about four times as long as the traditional suggestopedia course, we have 28 different concerts and have found that there are some problems with this. First, we noticed that after the 12th or so concert, it becomes difficult to maintain the ritual effect. The students become less interested in this common and frequent activity, and it becomes difficult to maintain the necessary ritualized atmosphere to promote an appropriate amount of learning. The solution that we have found is to use a single piece of music rather than the classical and baroque segments that are traditionally used. With a single and complete piece of music, the students seem to look forward to each concert session throughout the year. Although we have not performed experiments to determine the actual loss in retention, if any, we find the retention level to be acceptable in support of the main goal of the course, the development of fluency.

The readings themselves are in the usual format: during the first reading, the teacher follows the music and uses a variety of intonations to mark the language; during the second, the teacher reads in a normal voice. There is usually little if any time left at the end of the first reading, but at the end of the second, there are usually ten minutes or more remaining. The students sit quietly and enjoy the music during this period.

Elaboration

We have two distinctly different types of elaboration; four periods with 40 students and three periods with 20 students. The remaining period is used for the concert session and has 20 students in the class. The reason for this arrangement is an administrative requirement to retain the same teacher-to-student ratio as in the regular classes.

With 20 students

During the early stages of the course, these class periods are used for atmosphere building, communicative games and activities, role plays, etc., creatively and systematically interwoven with detailed work with the text. At first this detail work consists of the students reading the text in chorus. The students generally become proficient at this very quickly, so after a few weeks, we begin a new activity. The students work in pairs. One student has the open text and reads an English sentence from the current chapter. The other student explains the meaning in Japanese. The first student gives hints and clues if the second falters. They are free to stop and discuss the meaning or language in either language. The teacher circulates to answer questions or assist in any way possible. Also, the suggestion of the teacher's presence encourages the students to remain focused on the work at hand. Feedback has indicated that the students enjoy this activity and feel that it contributes greatly to their learning. The games always have an obvious relation to the text and are used to highlight structures and vocabulary as well as to build a group feeling among the students, who quickly begin supporting and helping each other. The games are designed so that no one wins or loses a game because of their English ability, and scoring is calculated by teams so no individual student is ever embarrassed. We use many information gap activities, such as giving one student a

picture which she describes to her partner who reproduces the picture from the discussion only. The subject matter of such pictures is always selected so that it relates in some obvious way to the content of the current chapter of the text. Frequently, we use student-generated materials as the basis for activities. The goal of each of these activities is to move the students a little further toward the point where the students can sit and converse in English about subjects of their own choice, an activity which becomes more and more frequent as time passes. During the second trimester, two or three students a day "Show & Tell" and in the third trimester they tell anecdotes or short stories.

With 40 students

During these periods, we conduct large scale communicative activities; taking surveys of information about the other students, for example. Time is given to the students to read books of their own choice and to write. During these "quiet times," the teachers interview the students either individually or in small groups in response to the students' often expressed desire to chat with their teacher. During the second and third trimesters, the students are required to give formal presentations during these periods. Working in groups of three, they do research, prepare content, rehearse, and then give a 30-minute presentation in English about something that their classmates probably do not yet know. Also, during this time, homework assignments are given and students have time to ask questions about the homework or any of the classwork.

Homework

A variety of homework is assigned to the students. None of this work is of the routine repetitive variety which is often given to language students in Japan. We require the students to read at least 400 pages outside of class each trimester. The students select a book

and bring it to the teacher for approval. We try to keep the books at the appropriate level for the individual student; easy enough so that they can "read" and not spend all their time using a dictionary. Student selections have ranged from reduced-language readers to novels such as *Mosquito Coast*. After reading the books, the students write book reports which are turned in to the teacher. Also, three or four times a week, the students must write a journal telling about their reactions to class or their daily lives. They must also write a series of formal papers which are revised a number of times before being submitted. Working through these papers teaches the students the necessary skills to write the reports which will be required of them during their second year. None of these are actually graded but they must be turned in or the student loses a grade.

The Future

The lesson plans to accompany *In for a Penny, in for a Pound* will continue to be improved. This is a process that will never end, as it will always be possible to increase the students' learning. We will continue to experiment with small variations in the lesson plans to keep them relevant to our students' needs and increase their acquisition of English.

We have received permission to begin the development of a special program for the freshman students with the lowest scores on our placement test. They often score less than chance on the multiple choice portion. This lack of English ability is often accompanied by a general weakness in all academic subjects and in study skills in particular. At present a preliminary study is in progress to determine the characteristics of the text which would be best suited for working with these students. So far it has been determined that it will consist of a dialogue with supplemental readings

and listening passages. In addition to the usual role plays, we are planning to introduce a substantial amount of TPR-like (Total Physical Response) activities.

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Reference

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Un programme suggestopédique au Japon.

Cet article retrace l'histoire et le programme de l'Institut Kawaijuku d'apprentissage suggestif-accéléré (Kisal), au College Trident de Nagoya, au Japon. Bien qu'il ne soit pas particulièrement connu, ce programme qui remporte beaucoup de succès entre maintenant dans sa neuvième année continue d'opération. L'auteur a d'abord retrace le développement progressif du programme. Puis, le cours et les matériaux sont décrits, avec quelques détails. L'article se termine avec une brève discussion sur les projets futurs.

Ein suggestopädisches Programm in Japan.

Diese Arbeit umreist die Geschichte und das Programm des Kawaijuku Institut für suggestiv-beschleunigtes Lernen (KISAL) am Trident College in Nagoya, Japan. Obwohl es nicht besonders bekannt ist, beginnt dieses erfolgreiche Programm jetzt sein neuntes ununterbrochenes Betriebsjahr. Zuerst ist die allmähliche Entwicklung des Programms nachvollzogen, dann werden die augenblicklichen Kurse und Materialien detailliert beschrieben. Die Arbeit endet mit einer kurzen Diskussion zukünftiger Pläne.

Un programa de Sugestiopedia en el Japón.

Este artículo explica en términos generales la historia y el programa de aprendizaje acelerado Sugestiopedico realizado en el Instituto Kawaijuku (KISAL), Universidad de Trident en Nagoya, Japón. Aunque este no es particularmente muy conocido, dicho programa ha tenido mucho éxito. Este es su noveno año. Primero se diseña el desarrollo gradual del programa. Después se describe con cierto detalle el actual curso y los materiales utilizados. El artículo concluye con una breve discusión sobre los planes para el futuro.

Suggestopedia in Terms of the Second Language Acquisition/Learning Theory of Stephen Krashen*

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Abstract. In this article Suggestopedia as a second language teaching method is scrutinized in terms of Stephen Krashen's theory of L2 acquisition/learning. Krashen's work has been selected because it is regarded by many as an extensive and explicit theory providing directives within a well integrated and convincing conceptual framework.

Krashen's work has a distinct theoretical character, therefore the theory underlying Suggestopedia (i.e., its basic premises and principles) is discussed in terms of Krashen's hypotheses. Furthermore, because many didactical applications are implied by Krashen, the psychological, didactical and artistic means of Suggestopedia are looked at in terms of Krashen's work.

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*Paper delivered at 1988 SALT Conference in Phoenix, Arizona.

Introduction

We are involved in an effort to do something about the educational situation in our country. Although the improvement of language, thinking and teaching skills are our major concerns, it is hypothesized that our approach could make a significant contribution towards improved education and a healthier society.

As pointed out by my colleagues, Drs. Thembela and Odendaal, we have explored and used Suggestopedia as a means to assist us in the upgrading of language proficiency of the English L2 learners in South Africa. Suggestopedia was tested from an empirical point of view and from a more linguistic theoretical point of view which implies strategies for practical application in the language class. This paper will deal with the comparison between Suggestopedia and another theoretical approach to language teaching and learning, that of Krashen.

Why Krashen's L2 Theory was Selected to Compare with Suggestopedia

There is a definite shift in L2 teaching towards more emphasis on the affective domain of the learner as well as on the role of the subconscious in the acquisition of another language. Like Lozanov, Krashen also addresses both these aspects. Although his work received some criticism (Carroll, 1986, Klein, 1986, and McLaughlin, 1987), many applied linguists recognize his hypotheses as probably of the soundest to date (Krahnke, 1985; Stevick, 1986; and Vanpatten, 1987). Krahnke (1985) states the following about Krashen's theory: "The theory will undoubtedly be refined and modified, but for the present, it is the most extensive and explicit theory of second language acquisition available."

Because Suggestopedia is considered by many as an unproven method with serious shortcomings and unrealistic claims (Mans, 1981 and Scovel, 1979), it was decided to compare it with a widely accepted theory of language learning. The comparison indicates that Suggestopedia has a firm theoretical basis and that it may even be more explicit and more fully refined than many other methods used in the world.

Procedure

In this paper Krashen's L2 Theory and Lozanov's Suggestopedia are compared in terms of their underlying principles as well as application of the theory in the classroom. Krashen (1982a) himself observes that Suggestopedia meets many of the requirements of his own theory, especially those of providing massive amounts of comprehensible, interesting and relevant input; lowering affective barriers; emphasizing meaningful communication and utilizing more of the whole-person potential.

It is also important to note that the comparison is between a didactical approach (Suggestopedia) which includes theory, and a theory (Krashen's L2 Theory) which addresses L2 acquisition/learning. This paper deals with similarities between the two and shows that Lozanov's Suggestopedia made a significant contribution to the practical application of the underlying theory.

The term *Construct* is used for the Krashen hypotheses as well as the suggestopedic components. Lozanov's constructs, namely, the two basic premises, three principles and three sets of means, are compared with Krashen's theory in its entirety. The comparison is made by seeing whether each of the eight constructs of Suggestopedia **agrees with, disagrees with, or is neutral** towards each of the seven Krashen hypotheses.

An additional construct of each approach is included in the comparison, namely whole-brain involvement of Suggestopedia and neurological implications of Krashen's Theory.

Comparison

The results of the comparison are given in the following table (see next page):

Looking at the tabular representation it is clear that there is much more agreement than disagreement or neutrality. There is complete agreement on six of the eight Krashen constructs. Of the remaining two constructs, Suggestopedia is neutral. Regarding the Aptitude Hypothesis, and towards the Monitor Hypothesis it shows some agreement, some neutrality, and only one point of disagreement. In other words, of 72 possible points, 58 show agreement (80.5%), 13 neutrality (18.1%) and only one disagreement (1.4%).

Discussion

In the discussion of the first comparison the constructs of Suggestopedia are given in some detail, which will not be necessary in subsequent discussions.

Suggestopedia and the Acquisition/Learning Hypothesis

The Acquisition/Learning Hypothesis states that people become proficient in an L2 by subconsciously *picking up* a language (which Krashen terms **acquisition**) rather than consciously studying grammar rules (which Krashen terms **learning**). The instructional process focuses on providing more opportunities for the student to acquire implicitly rather than on learning explicitly.

Table 1: Suggestopedia compared with Krashen's L2 theory

Krashen's L2 theory hypotheses	Lozanov's suggestopedia									
	Premises			Principles			Means			WI*
	RP	UP		JO	SC	SL	PM	DM	AM	
1. Acquisition/ learning	+	+		+	+	+	+	+	+	+
2. Natural order	+	+		+	+	+	+	+	+	+
3. Monitor	/	/		+	-	/	+	+	/	+
4. Input	+	+		+	+	+	+	+	+	+
5. Affective filter	+	+		+	+	+	+	+	+	+
6. Aptitude	/	/		/	/	/	/	/	/	/
7. First language	+	+		+	+	+	+	+	+	+
Neurological implications	+	+		+	+	+	+	+	+	+

* RP: Relatively unlimited potential

UP: Under-utilization of potential

JO: Joy, absence of fear

SC: Simultaneous use of conscious and paraconscious

SL: Suggestive link

PM: Psychological means

DM: Didactic means

AM: Artistical means

WI: Whole-brain involvement

Note: + : in agreement; / : neutral; - : disagree.

* * * * *

Krashen regards acquisition as central and learning as peripheral. Krashen (1982) says (p.24):

"...first we understand the message and that 'teaches' us grammar, not vice versa."

Lozanov's (1978) approach is in agreement with this hypothesis. His **two premises**, namely that the brain is relatively unlimited and that traditional teaching methods under-utilize the real potential of the human brain, agree with Krashen's construct that learners should first and foremost acquire, then utilizing their reserve capacities situated mostly in the paraconscious. If the emphasis is on learning only, then the potential of the paraconscious is disregarded and only a relatively small portion of the real potential of the brain is tapped.

Lozanov's (1978) **principles** also favor acquisition as the primary force in mastering an L2. Joy and the absence of fear and anxiety provide for a teaching climate where learners feel secure in an atmosphere of trust. Thus learners feel free to acquire.

The second principle, namely the simultaneous use of the conscious and paraconscious, engages the learner beyond conscious attention in the language material. Humor, symbols, games, metaphors, defocusing of material are, amongst other techniques, significant in providing wide opportunities for the simultaneous use of the conscious and paraconscious, and therefore for acquisition. It is evident that these techniques can also be utilized to teach material which will be more consciously and explicitly learned.

The third principle, the suggestive link, is in full agreement with Krashen's Acquisition/Learning Hypothesis. The suggestive link, where teacher-learner and learner-learner relationships are nurtured, where the classroom atmosphere is characterized by mutual respect, mutual trust and open communication, demands

exactly the kind of atmosphere Krashen and Terrel (1983) refer to when they say (p.59):

"The Natural Approach aims to bring it (the Affective Filter) down to as low a level as possible by taking the students off the defensive."

"Affective activities attempt to involve student's feelings, opinions, desires, reactions, ideas and experiences. ...more importantly, they meet the requirements of an acquisition activity: the focus is on content, i.e., what the students are saying, and the instructor makes a strong attempt to lower affective filters."

The **three sets of means** in Suggestopedia also correspond with Krashen's Acquisition/Learning Hypothesis: the psychological means attempt to re-organize the psychological needs (which include the emotional needs) of the learners in part by endeavouring to change the conviction that their potential is limited. Didactical means like provision of the "Big Picture", massive and rich input, immediate feedback, defocused learning, etc are all in agreement with Acquisition/Learning Hypothesis. The arts are rich in suggestion and they appeal to the emotions by activating those parts of the brain dealing with feelings. By contrast, most of traditional education bypasses emotion and confines its appeals to cognition only, which activates mainly the cortical structures and ignores the rest of the brain's potential.

In all three sets of means the focus is on meaning, on the context, on the whole, on aesthetic appeal, on relaxation, on positive expectations, on defocused learning, on subconscious internalization of language, on good, communicative language teaching didactics, and on a happy, relaxed student; therefore acquisition of the language remains central to the approach.

Whole-brain involvement as seen by Lozanov is in agreement with process of acquisition as the main process for L2 proficiency. Krashen (1981) states (p.77):

"The available data strongly suggest, however, that subconscious language acquisition is nevertheless the central means by which adults internalize second languages..."

The point to make here, is that Krashen seems to suggest that the whole brain (the conscious, paraconscious, left and also the right hemispheres - even in adults) is inseparably involved in second language acquisition/learning.

The following quotation illustrates the correlation between the two approaches as far as whole-brain involvement is concerned, and it is also indicative of the extent to which Lozanov (1978) understands and describe the role of the brain in suggestopedic learning:

"The global approach to personality, the "vol-umely" [not linearly] organized instruction, the simultaneous utilization and activation of the conscious and paraconscious functions, the simultaneous participation of man's mental and emotional sides, the simultaneous participation of the left and right hemispheres of the brain, as well as those of the cortex and subcortex - all these are of great importance for the global and many-sided influence of Suggestopedy over the personality(p.225)."

Suggestopedia and the Natural Order of Acquisition

This hypothesis states that sound patterns, lexical items, and grammatical structures are acquired in a predictable order, though not necessarily at the same tempo. This order holds when language is acquired naturally rather than learned grammatically, and it applies in general to both adults and children.

While the proponents of Suggestopedia do not express any direct viewpoints on this matter, it is supported indirectly as a guideline for how acquisition can be expected to take place. Lozanov (1978) says that the open and receptive way a child learns is the ideal way for an adult to learn. The main thrust of suggestopedic material remains roughly tuned, in Krashen's phrase, to a specific group, thus allowing students to select what they acquire by a natural process rather than learning according to an order determined by teacher or text.

Suggestopedia and the Monitor Hypothesis

According to Krashen and Terrell (1983), consciously learned material, rules for example, serves as a monitor or editor, which comes into play only after an utterance has been generated, implying acquisition has already taken place. The monitor tests the utterance against the rules and makes corrections as needed.

The psychological and didactical means of Suggestopedia as used by some teachers agree with Krashen's Monitor Hypothesis, because the provision for rules and grammar is needed by some students. If these rules and grammar explanations are provided fear and anxiety decrease and the students find it easier to relax. Relaxed students are more likely to utilize the whole-

brain, or, to put it differently, to benefit from the simultaneous integration of the brain systems. This can be achieved even if there is some conscious focusing of use of the Monitor. It will suffice to say that, in a suggestopedic class, it is believed to be possible for a student to focus consciously on some grammar, to absorb aspects of the language paraconsciously, to involve left and right hemispheres simultaneously as well as cortical and subcortical structures. In view of this it can be concluded that the suggestopedic construct of whole-brain involvement is in agreement with the Monitor Hypothesis.

The suggestive link and artistic means do not correspond or differ from the Monitor Hypothesis. Suggestopedia is thus neutral towards the Monitor Hypothesis for these two constructs.

The only point of real difference in the two approaches comes with respect to the simultaneous use of the conscious and paraconscious. Krashen (1982) posits a sharp separation when he states categorically that acquisition is not dependent on learning and that learning does not turn into acquisition. In Suggestopedia conscious and paraconscious activities are seen as inseparable and it is believed that consciously learned language material can after some time become automatized speech which is used without conscious attention. Learned rules can become defocused in activations where the attention is focused on something else, and then used fluently and communicatively. Yet Krashen would argue that a particular structure or rule was acquired through meaningful communication and not through conscious learning of the structure. This uncertainty actually underlines the idea that the unrelat- edness of paraconscious acquisition and conscious learning may not be as evident as Krashen states, but may be operating simultaneously, as Suggestopedia

holds. Stevick (1984) and Horner (1987) also disagree that the two modes are independent and separate.

Suggestopedia and the Input Hypothesis

The Input Hypothesis states that learners acquire language by understanding input which includes language a little beyond their current level of competence, or input plus one ($i+1$). This input must be extensive and adapted in a general way to the level of the students (roughly tuned material). Missing are requirements that input be carefully limited and controlled. Observes Krashen (1982):

"...the profession has seriously underestimated the amount of comprehensible input necessary to achieve even moderate, or intermediate levels of proficiency ..." (p.71)

Suggestopedia is in full agreement, ensuring that learners understand by all means, even L1 translations. Lozanov (1978) explains:

"The suggestopedic textbook must be in accordance with the principles of suggestopedy. This means that the material for each new lesson must be given in large portions and the theme of each lesson must be complete and given globally. The material must be presented in meaningful aggregates, and must be communicative. The textbook should have motivational force, and should be entertaining and interesting for the students." (p.278)

It is clear that the input provided in a suggestopedic session by means of a variety of techniques, e.g. visualizations, peripheral material, activations, text material, etc, exposes a student to massive amounts of target

language, contrary to many other methods used in the world.

Suggestopedia and the Affective Filter Hypothesis

This hypothesis states that people with certain personalities, attitudes and motivations perform better in L2 acquisition. Intrinsic motivation, good self-confidence and low anxiety are helpful, as are certain situations (Krashen, 1982). The filter functions as a screen between input and the language acquisition device in the learner. Krashen (1982) states:

"If the affective filter is 'up', no matter how beautifully the input is sequenced, no matter how meaningful and communicative the exercise is intended to be, little or no acquisition will take place." (p. 110)

Suggestopedic language teaching is largely in agreement with the Affective Filter Hypothesis and probably handles the role of the filter (or anti-suggestive barriers) with much more care and circumspection. Lozanov (1978) considers the role of lowered barriers important both for language acquisition and for releasing the reserve capacities of the human brain in general. Stevick (1976) points out that lack of defensiveness and *wholesome attitudes* on the part of the learner have to do with the learner's psychic state: "Here is where the theoretical and experimental basis of Suggestopedia is much more fully elaborated than we find with any other system of language teaching, and here lies, in my opinion, its most distinctive and its most interesting contributions. Suggestopedia ... tells us that once doubts and defenses have been removed, nothing can stop a learner who has the usual extrinsic motivation." (p. 158)

Suggestopedia and the Aptitude Hypothesis

Some individuals have a special aptitude for L2 study through cognitive, rule-based, conscious analysis and this aptitude is more oriented to **learning** (as Krashen uses the term). Grammar-based class instruction, say Krashen and Terrell (1983), will benefit these individuals, but in a communicative approach high aptitude may not be of much assistance.

In Suggestopedia, formal language study is second to informal, communicative activities. It gives a nod in the form of some grammar explanations to learners who wish to proceed via grammar and at the same time it tries to open them up by desuggestion of limits implied in this approach. Suggestopedia therefore neither supports nor opposes the Aptitude Hypothesis and can be said to be neutral towards it.

Suggestopedia and the First Language (L1) Hypothesis

This hypothesis says that the L1 is used as a substitute utterance initiator in situations where the person has not yet acquired enough of the target language, leading to *performance without competence* (Krashen, 1982).

In Suggestopedia, students are never encouraged to mix the two languages in speech production. They are allowed a silent period, or they use L1 responses before L2 speaking emerges, suggesting that the brain is quite capable and will acquire given time. Agreement with the Acquisition/Learning and Input Hypotheses further evidences agreement with the L1 Hypothesis.

Neurological correlates of Second Language Acquisition

As was mentioned previously, Krashen (1981) states that research indicates that, even in adults, both hemispheres of the brain play an important role in L2 acquisition and that subconscious language acquisition is the central means by which a second language is internalized. It also appears that the right hemisphere is involved in normal L2 acquisition much the same way it is involved in L1 acquisition (Krashen, 1981).

Suggestopedia is designed to involve the whole brain, obtaining simultaneous integration of all the brain systems, and thus ensuring optimal acquisition/learning.

Whole-brain involvement as theorized by Suggestopedia relates to some extent to all of Krashen's hypotheses and seems in agreement with them.

Conclusion

It thus seems that Krashen's and Lozanov's work are especially in agreement in the following areas: more emphasis on the affective domain of the L2 learner, the simultaneous utilization of the conscious and paraconscious and a richer, more open and more comfortable environment as the most effective way in which educators can optimize the natural human capacity for language acquisition.

It is noteworthy that the suggestopedic approach originated not in linguistics but in the medical field, and it is interesting that Lozanov arrived largely (explicitly and implicitly) at the same insights with regard to language acquisition/learning as linguists like Krashen. It is a further validation of Suggestopedia that Lozanov's implied theory not only corresponds with the theory of a linguist of importance, but also that it appears that

Lozanov's didactical approach is more explicitly and fully elaborated than that of Krashen. At the same time the similarity of the two approaches not only confirms that they have some common denominators in second language teaching which are based on sound neurological and applied linguistic principles, but also that Suggestopedia deserves more recognition for the ingenious way language is taught communicatively in a suggestopedic course. The happy students, as well as the good results obtained in a relatively short time, further underline the point that all serious language teachers could benefit from greater attention to the approach called Suggestopedia.

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La suggestopédie, analysée à travers la théorie de Stephen Krashen sur l'acquisition/apprentissage d'une seconde langue.

Dan cet article, la suggestopédie, en tant que méthode d'enseignement d'une seconde langue, est rigoureusement examinée sous l'angle de la théorie de Stephen Krashen sur l'acquisition/apprentissage en langue seconde.

L'étude de Krashen a été choisie parce que beaucoup la considèrent comme une théorie approfondie et explicite, fournissant des directives à l'intérieur d'une structure bien intégrée et convaincante du point de vue conceptuel.

Le travail de Krashen a un caractère théorique particulier, c'est pourquoi la théorie sous-jacente à la suggestopédie (c'est-à-dire ses prémices et principes de base) est discutée en fonction des hypothèses de Krashen. Par ailleurs, du fait que Krashen sous-entend de nombreuses applications didactiques, les ressources psychologiques, didactiques et artistiques de la suggestopédie sont envisagées sous l'angle de son travail.

Suggestopädie im Sinne von Fremdsprachenerwerbungs-
erlernung Die Theorie von Stephen Krashen.

In diesem Artikel ist Suggestopädie als eine Methode des Fremdsprachenlehrens im Sinne von Krashen genau geprüft. Krashens Arbeit ist gewählt worden weil sie von vielen als eine ausgedehnte und eindeutige Theorie angesehen wird, die für Anweisungen in einem wohl integrierten und überzeugenden begrifflichen Rahmen sorgt.

Krashen's Arbeit hat einen eindeutigen theoretischen Character. Darum wird die Theorie, die der Suggestopädie zugrunde liegt (d.h. ihre grundsätzlichen Prämissen und Prinzipien) im Sinne von Krashen's Hypothesen diskutiert. Ausserdem werden, da viele didaktischen Anwendungen bei Krashen enthalten sind, die psychologischen, didaktischen und künstlerischen Mittel der Suggestopädie im Sinne von Krashen's Arbeit angeschaut.

La sugestiopedia en términos de la teoría de Stephen Krashen sobre el aprendizaje y adquisición de una Segunda Lengua.

En este artículo la Sugestiopedia como método de enseñanza de una segunda lengua es examinado en términos de la teoría de Stephen Krashen sobre la adquisición y aprendizaje de una segunda lengua. El trabajo de Krashen se ha seleccionado puesto que está visto como una extensiva y explícita teoría que provee instrucción dentro de una estructura conceptual integrada y convincente.

The Effects of Guided Imagery on Basal Metabolic Rate

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Abstract. The effects of guided imagery on basal metabolic rate (BMR) were investigated using 27 male and female adult volunteers. Subjects practiced guided imagery using a 15 minute cassette tape for increasing metabolism twice a day for six weeks. There was a significant increase in metabolic rates with use of the tape during both pretest and posttest sessions, $p < .003$ and $p < .001$ respectively. There was not a significant change in baseline BMR measures. However, some individuals exhibited remarkable increases in BMRs, e.g., 813 to 1896 calories per 24 hours. Despite a significant increase in composite imagery scores, $p < .001$, there was no consistent corresponding increase in individual components of imagery such as vividness, strength, etc., as found with imagery in the treatment of disease. The components of imagery in metabolism may differ from those involved in the disease process. This, along with differences in individual performances, merit further investigation.

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The Effects of Guided Imagery on Basal Metabolic Rate

SALT or Suggestopedia has been found to affect the learning of many different types of material. Imagery, as an important aspect of Suggestopedia, affects areas other than typical classroom subjects as demonstrated in this research. Since the classic experiments of Pavlov, we have known that visceral learning occurs along with cognitive learning. Usually, cognitive learning is our objective in teaching while visceral learning (a predictable physiological response triggered by a specific stimulus) occurs unconsciously, or at least secondarily to cognitive learning. In the case of this research, learning a visceral response was primary and was directed toward the expressed purpose of increasing basal metabolic rate (BMR, the energy required to carry out body processes at rest; BMR is measured as calories per 24-hour period).

The prevalence and incidence of obesity and overweight is increasing and is perhaps the number one nutritional health problem in the United States. Along with the detrimental physical effects of this problem, overweight individuals must also endure the stress arising from the differences between the reality of their condition and societal expectations of feminine beauty and masculinity, the former being equated with thinness and the latter with strength and leanness. As a result, a great number of individuals attempt to lose weight in an effort to achieve their or society's ideal. Their success rate, however, is poor with changes in weight small and relapse relatively high (Forety, et al., 1981; Wilson and Brownell, 1980).

When prescribing diet plans for weight loss, the typical approach is to reduce caloric intake with the assumption that if one reduces caloric intake below that

of caloric expenditure, one must lose weight. One can accurately predict weight loss over time with this simple approach if one knows at what point and to what degree a caloric deficit occurs. Since a pound of fat is worth approximately 3500 calories, a deficit of 500 calories per day results in a loss of one pound per week. However, most people who have worked with dietary and weight control counseling, as well as dieters, can bear testimony to the fact that something more is needed to predict weight loss. Some people, especially middle-aged and older women, cannot lose weight or lose very slowly (1/4 pound per week) on as little as 700 calories per day even with moderate exercise. This intake is too low to meet standard nutritional requirements. Thus, even the most committed, goal-directed individual is placed at a distinct disadvantage. The problem lies in creating a deficit. Although researchers are delving into the problem of slow or no weight loss and relapse, there are few solutions. Further, the reasons for the problem are largely ignored in current popular literature. This leaves the frustrated dieter grappling with the problem alone, and he/she is often written off by the counselor and others as a "cheater" who does not have the will power to stick to a prescribed program.

The two most plausible explanations for the creation of the deficit problem include individual variations in basal metabolic rate and the set point theory. On individual variation, Garrow (1978, p. 201) states that individuals of the same age, sex, and surface area may have differences in metabolic rate of 30%. Therefore, one person may lose weight while a similar person may gain weight on the same dietary intake. Further, many factors are known to influence metabolic rate such as type of food ingested (SDA, specific dynamic action of food), age, climate, fever, sex, illness, exercise, sleep,

and diet. For example, starvation lowers metabolism as much as 50% (Krause & Mahan, 1979; Astrand & Rodahl, 1977; McMinn, 1984).

The second explanation is provided through the "set point" theory. The set point theory postulates that we have a natural biological set point for body weight. Acting much like a thermostat for weight, adjusts metabolism or behavior to compensate for fluctuations in weight due to overeating or inadequate intake, e.g., during illness. For the person voluntarily losing weight, the biological feedback system would set up an unbalanced condition when body weight falls below his/her set point (McMinn, 1984). The body compensates for the fall by becoming hungry. What results is a war of will over physiology. If we accept the theory, we accept the fact that some people are just naturally overweight and/or fat because their set points make them so. However, some animal and human studies support exercise as an effective means of reducing set point levels (Applegate, 1984). Perhaps there are other ways as well.

Borrowing from the psychosomatic medicine and biofeedback fields which are based on the body-mind connection, one might effectively apply this "connection" to the physiological aspects of low basal metabolism-weight control problems. The body-mind connection is summarized by a statement made by the pioneers of biofeedback, Elmer and Alyce Green of the Menninger Clinic:

Every change in the physiological state is accompanied by an appropriate change in the mental emotional state, conscious or unconscious, and conversely, every change in the mental emotional state, conscious or unconscious, is accompanied

by an appropriate change in the physiological state (Simonton, et al., 1978, p. 29).

The resolution of this connection is demonstrated by the evidence that individuals can "learn how to activate and suppress the activity of individual motoneurons in the spinal cord that control the activity of muscle cells" (Brown, 1983, p. 254). Both Simonton and Brown have stated that every physiological function which can be accurately measured and fed back to the subject, the subject can learn to control.

The work with imagery in the health field is impressive, but most is done on a case study basis and with individuals with acute medical problems, particularly cancer. Despite the lack of controlled empirical studies on imagery per se, the mounting case study reports of success seem to be evidence enough for more and more facilities and institutions, especially hospitals, to begin supplementing traditional modes of treatment with imagery techniques.

O. Carl Simonton (oncologist), Judith Green (psychotherapist), and Jerry Jampolski (Center for Attitudinal Healing) are among the leaders reporting remarkable success with treatment of disease and disorders with imagery. However, empirical studies demonstrating the specific physiological responses of imagery are hard to come by. Dr. Jeanne Achterberg and Dr. G. Frank Lawlis (1984) have done extensive imagery work with cancer patients, diabetic patients, and patients with chronic pain. They have developed a test instrument to quantify and qualify images and have found predictors, expressed in images, for outcome of treatment.

Similar imagery work might be effectively applied to the physiological area of weight control. Just as it is

natural for the body's immune system to fight disease, it is natural for the body to burn fuel. Applying the body-mind connection for the purpose of normalizing or increasing metabolism through imagery may provide a solution to the creation of deficit problem other than, or as a supplement to, exercise. The purpose of this research is to investigate the effects of guided imagery on basal metabolic rate.

Methods

Participants

Through press releases from the University of Wisconsin-Oshkosh News Bureau, 47 volunteers were recruited on a first come, first serve basis from Oshkosh and surrounding areas. The subjects agreed to the conditions of the experiment, initially via a telephone conversation and later by informed consent forms which were mailed to them along with confirmation of their appointment times for pretest and posttest sessions.

A total of 27 of the original 47 subjects were utilized in the statistical analysis. The other 20 were eliminated for many reasons, the majority being failure to comply adequately with the controlled conditions of the experiment. The subjects included 7 males and 20 females with age ranging from 20 to 58, $M=43.7$. All but one of these subjects considered himself/herself overweight and had repeatedly attempted to lose and maintain ideal weight without success.

Procedures

Subjects were given a series of pre- and posttests at The School of Nursing, University of Wisconsin, Oshkosh. The testing, which took approximately 1-1/2 hours to complete, was arranged by appointment for the convenience and comfort of the subject. The tests

included a BMR (basal metabolic rate) test and an imagery interview. Heart rate was also monitored.

The tests were conducted in a quiet, private room. After a brief instruction on imagery and initial interview, the subject rested quietly or slept for approximately 30 minutes, as readings for BMR and heart rate were periodically monitored.

After 30 minutes, the investigator gently alerted the subject that the cassette recorder would be started. The subject listened to the 15-minute tape and followed the instruction in guided imagery in a relaxed, passive manner. BMR was monitored during and at the completion of the tape.

The subject was then given a structured interview to collect and quantify information on the imagery experience. The interview was recorded.

Following the pretest, the subject was briefly instructed in a) the use of imagery techniques and the exercise/diet journal, b) to use the cassette tape twice per day, once upon arising and once in the evening, ideally, c) to use the imagery activities at any time, any place, without the tape, especially during exercise, d) that imagery is a skill which takes time and practice to develop, e) to expect a weekly telephone call to check on his/her progress and to provide an opportunity to ask questions, f) to be honest in reporting, i.e., honesty is more important to the study than data for data's sake or pleasing the researcher, and g) to read the Imagery Manual provided within a week.

Apparatus and Materials

The BMR Test. The computerized MGM/TWO Metabolic Gas Monitor was used to measure BMR. The overall accuracy of oxygen consumption and carbon

dioxide production was reported by Utah Medical Products to be $\pm 5\%$ full scale.

The subjects fasted 12 hours before the test, abstained from caffeine and tobacco consumption, and refrained from exercising before measuring BMR. Exercise, stimulants, and the digestion of food increase metabolism, therefore, these procedures are necessary to ensure accurate results. Tests were conducted early in the day so that the subjects were rested and did not have to endure long periods of hunger.

The Imagery Evaluation. This instrument was adapted from the instrument Acterberg and Lawlis (1984) use for cancer patients specifically for the purposes of this study. A series of questions was asked of the subject after listening to the imagery tape. The interview was scored for various components. It was assumed that the better one is at the skill of imagery, the more effective the imagery would be in increasing metabolism. Further, since the purpose of the experimental treatment was to practice and improve imagery skills over a 6-week period, posttest scores should be higher than pretest scores.

The Journal. The subject kept a daily journal which was provided for him/her. The journal had several purposes: It indicated amount of practice time; variation in diet, exercise, or health which may influence outcome; and changes in experiences and content of the imagery itself. The subject was not included in statistical analysis if a) activity and dietary habits changed significantly during the 6-week course of the experiment, b) if usage of the tape dropped below 70%, and/or c) if he/she was ill.

The Guided Imagery Cassette Tape. This tape was written and produced specifically for this experiment. The primary focus was on changing BMR and included a) a brief introductory relaxation technique, b) traveling through the interior of the body, c) changing set point in the hypothalamus, d) increasing secretion of certain hormones such as thyroxin, and e) imagining an increase in the burning of fuel (caloric consumption).

The Imagery Manual. The Imagery Manual was written specifically for this experiment with the purpose of providing the subject with a reference describing the characteristics of imagery and conditions which enhance the imagery experience.

Results and Conclusions

The results of the t tests presented in Table 1 indicate that subjects were able to significantly increase their basal metabolic rates through the use of guided imagery during both pretest and posttest sessions, $p < .003$ and $p < .001$, respectively. Although imagery skills of subjects improved significantly over the 6-week treatment period as expected ($p < .001$), results seem to indicate that practice is not necessary to effectively elicit a short-term increase in BMR.

There was not a significant change from pretest to posttest baseline BMRs ($p < 0.089$). However, several individuals did exhibit rather remarkable increases in BMRs, e.g., 314 to 1993, 813 to 1893, 1290 to 1522, 857 to 1407, and 921 to 1381. These initial values may be unusually low due to years of dieting, use of fad diets, dieting without exercise, or hypoactive thyroid function. Imagery may work to normalize body function rather than create "superburners." Relaxation techniques can serve to decrease abnormally high blood pressure. Perhaps, imagery has a similar effect on abnormally low metabolism.

Table 1. Data and T Tests for Basal Metabolic Rate
(N=27)

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>T Value</i>	<i>Prob.</i>
BMR Pretest	1283	290.9	-1.76	0.089
BMR Posttest	1382			
BMR Pretest	1283	146.7	-2.25	0.003
Tape BMR Pretest	1346			
BMR Posttest	1382	116.7	-3.61	0.001
Tape BMR Posttest	1462			
Tape BMR Pretest	1346	332.1	-1.82	0.081
Tape BMR Posttest	1462			

Note: BMR is expressed in units of calories per 24 hour period. Tape BMR: The BMR measured at the completion of listening to the cassette tape.

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Conversely, some individuals actually lowered BMR. These people reported either one of two conditions. One, they experienced some distress during the initial testing session, primarily discomfort with use of the face mask of the gas monitor which fit over the nose and mouth. A full face mask is recommended for further study. Two, subjects reported that they learned how to relax with the use of the tape. In retrospect, this is not surprising because the introduction of the tape was a relaxation activity. This was included to facilitate imagery. These subjective reports of relaxation were accurately reflected in decreased heart rates

from baseline to tape BMRs. If the study is replicated, it is recommended that all subjects be taught relaxation techniques before initial testing.

Just because one is listening to an imagery tape does not necessarily mean that he/she is "practicing" imagery, at least the suggested imagery. The imagery experience varies greatly between and among individuals. Eastern philosophers have stated that efforts to control the mind are much like trying to control a "drunken monkey." It is the natural tendency of the mind to wander. Words hold a myriad of connotations and associations unique to individuals based upon their past experiences. Therefore, a word or phrase may trigger unexpected responses. This was reported many times by subjects during their imagery interviews. For example, one subject reported, "I hate it when she (the narrator of the tape) says 'zero.' I don't know why, but I wish she would just stop at the number one."

This uncovers a problem in the development and production of imagery tapes. One tape cannot meet the individual preferences in style, tone, rhythm, rate, voice quality, and word choice for all subjects in a group. Subjects need to be instructed and reminded periodically that if something annoys them to "let it go" rather than dwell on the source of the irritation.

Acterberg and Lawlis (1984) reported several components of imagery which correlated positively with outcome in the treatment of disease. The components identified by Acterberg and Lawlis which were included and quantified in this study were vividness, strength, focus, effectiveness, and activity. Basal metabolic rates correlated positively with composite pretest and post-test imagery scores. However, there were no patterns of consistent positive correlation seen with individual components.

Table 2. Pearson Correlation Coefficients for BMR and Imagery Tests (N = 30)

	Imagery Pretest	Imagery Posttest
BMR Pretest	.38*	.49**
BMR Posttest		.18

*p<.05, **p<.01

* * * * * * * * *

The components of imagery in metabolism may be different from those involved in the disease process. This is an area which needs to be explored.

During the posttest interviews, several subjects reported being more energetic. Other reported that food simply was not as important to them nor were they hungry as often as they were before the experiment. These comments were unsolicited. The ways in which the hypothalamus and set point function precisely are unknown. These changes in subjects' perceptions may be a result of imagery influencing the hypothalamus and/or set point. At this point, what the influences are and what mechanisms are involved remains a mystery. However, for individuals who wish to control weight and eating behavior, these influences were enthusiastically embraced.

In conclusion, the practice of guided imagery under the conditions of this experiment significantly increased basal metabolic rate on a short-term basis. Several individuals demonstrated remarkable increases from pretest to posttest BMRs. Now, the challenge is to explore the possible factors which enhanced these indi-

viduals' performances over the other subjects. Also, changes in subjects' perceptions and the necessary components of imagery for the process of metabolism need further investigation.

From a subjective viewpoint, perhaps the greatest benefit to the subject of this study was the realization that he/she had the power to control a physiological process normally thought of as an involuntary process. Success in the area of visceral learning may enhance confidence in one's ability to create and control other areas of one's life. Including a measure of self-confidence or empowerment might be an interesting variable in the study of imagery and body processes.

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Les effets du développement d'images guidé sur le taux métabolique basal.

Les effets du développement d'images guidé sur le taux métabolique basal (BMR) ont été explorés grâce à 27 volontaires adultes, hommes et femmes. Les sujets ont

pratique le développement d'images guidé en utilisant une cassette de quinze minutes pour augmenter le métabolisme, deux fois par jour pendant six semaines. On a enregistré une augmentation significative du taux métabolique avec l'utilisation de la cassette, ceci à la fois pendant les sessions de pré-test et de posttest, respectivement ($p < .003$, $p < .001$). Il n'y avait pas de changement significatif dans les mesures BMR de base. Cependant, quelques individus ont montré des augmentations notables de leur BMR de 813 à 1896 calories par 24 heures. Malgré une augmentation significative dans les scores de développement d'images composite, $p < .001$, il n'y avait pas d'augmentation correspondante régulière dans les composantes individuelles du développement d'images, telles que la vivacité, la force, etc., comme on l'a trouvé avec le développement d'images dans le traitement des maladies. Il est possible que les composantes du développement d'images dans le métabolisme diffèrent de celles impliquées dans le processus de la maladie. Ceci, en plus des différences dans les performances individuelles, mérite plus de recherches.

Auswirkung von gelenkten Phantasiebildern auf das Stoffwechselsystem.

Die Auswirkung von gelenkten Phantasien auf das Stoffwechselverhältnis (BMR) wurde mit Hilfe von 27 männlichen und weiblichen freiwilligen Erwachsenen untersucht. Die Untersuchten übten gelenkte Phantasiebilder indem sie ein fünfzehn minutiges Kassettentonband welches die Stoffwechselaktivität erhöht, zweimal täglich über sechs Wochen anwendeten. Es gab eine signifikante Erhöhung der Stoffwechselraten durch Benutzung der Bänder während des Vor- als auch Nachtests ($p < .003$ bzw. $p < .001$). Es gab keine signifikante Veränderung in der grundlegenden Messung des Stoffwechsels. Einige Untersuchte jedoch zeigten erstaunliche Erhöhungen in BMR's z.B. 813 bis 1896 Kalorien in 24 Stunden.

Trotz der signifikanten Erhöhung der zusammengesetzten Phantasiebilderergebnisse, $p < .001$, gab es keine estsprechende Erhöhung in individuellen Bestandteile der Phantasiebilder wie Lebhaftigkeit, Starke usw., wie man sie in Phantasiebildern in der Behandlung von Krankheiten findet. Die Bestandteile der Phantasiebilder im Stoffwechsel mögen sich von solchen, die im Krankheitsprozessen involviert sind, unterscheiden. Dies, zusammen mit den Unterschieden in persönlicher Leistung verdient weitere Untersuchungen.

Efectos de Imagenación dirigida sobre un porcentaje metabólico basal.

Los efectos de la imaginación dirigida sobre un porcentaje metabólico basal fueron investigados usando 27 adultos voluntarios de ambos sexos. Tales individuos practicaron la imaginación dirigida usando una cinta de cassette de 15 minutos para aumentar el metabolismo 2 veces al día durante 6 semanas. Hubo un aumento significativo en los porcentajes metabólicos usando la cinta en las sesiones previas y posteriores al test, $p < .003$ y $p < .001$, respectivamente. No hubo un cambio significativo en las medidas de baselina BMR. Sin embargo algunos individuos mostraron remarcables aumentos en BMRs, por ejemplo, de 813 a 1896 calorías por cada 24 horas. A pesar de un aumento significativo en las puntuaciones en composición imaginativa, $p < .001$, no hubo un aumento correspondiente consistente en los componentes individuales de la imaginación tales como la vivacidad, fuerza etc., tal y como se encontró con la imaginación en el tratamiento de la enfermedad. Los componentes de la imaginación en el metabolismo pueden diferir de aquellos involucrados en el proceso de la enfermedad. Esto junto con las diferencias de actuación de cada individuo necesita mas investigación.

Imagery's Physiological Base: The Limbic System A Review Paper*

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Abstract. Reviews the conflicting reports which locate the site of imagery within the brain and proposes a process model of imagery in which imagery activates limbic system functioning. The effects that thinking imagistically have on the body and mind include immune activity, memory, emotional regulation and states of consciousness. This model proposes that imagery's efficacy can be enhanced by using techniques that respond to the way that the limbic system works.

* * * * *

Introduction

The physiological site of the imagery process within the brain remains a mystery even though many locations are proposed. Researchers have designated the right hemisphere of the cerebral cortex as the site of the imagery process (Deutsch & Springer, 1981). Achterberg (1985) locates imagery in the right hemisphere in the posterior parietal area. But she also states that both hemispheres may be involved at the location of the anterior frontal lobes. Farah (1984) proposes a com-

*Presented at the 3rd International Imagery Conference,
July 2 - 5, 1987, Fukuoka, Japan

pletely different location. Farah correlated brain lesions with the loss of imagery generation and as a result has isolated image generation in the posterior region of the left hemisphere. Erlichman and Barrett (1983) summarize this confusion in their review of neuropsychological literature, and conclude that imagery cannot be consistently identified with one hemisphere or another. Kosslyn (Farah, Gazzaniga, Holtzman and Kosslyn, 1985) has proposed that imagery has a number of separate components which may be in different sites within the brain.

Instead of concentrating on the site of imagery, it may be more functional to examine the structures of the brain which mediate imagery. A process model of the mechanism of imagery could have more utility than a static mode which specifies the anatomical location of imagery. It is also improbable that a model of the specific site of imagery could ever be accurate, since neuroscientists such as Lashley (Lashley, 1929) have had great difficulty in pinpointing locations of thoughts within the brain mass. Recent psychophysiological data (e.g. Achterberg, 1985; Rider et al., 1985; Wechsler, 1987) provide possible correlations between feelings or thoughts and chemical changes in the brain. These data could allow conclusions on brain structures which mediate image processing.

It is probable that the limbic system in the brain mediates imagery for a number of reasons. Limbic means rim in Latin, which describes the shape of this curved structure threading through the corpus collosum and embedded under the cerebral cortex. The limbic system is termed the paleomammalian brain by P.D. MacLean (1987). This implies that it regulates the early mammalian functions of emotions, hormonal regulation, motivation, attention and memory. Psychophysiological

and psychologists' research indicate that these functions are the ones most effected by mental imagery. Basing his conclusion on animal experiments, Karl Pribram (1981) states that the limbic system regulates imagery as well as other functions which include motivation, intuition, emotional response, attention and memory.

Imagery is effective in "talking" to the autonomic nervous system and can be used to change levels of various cells or hormones in the body (Achterberg, 1985; Rider, 1985). Imagery is also active in awakening memories embedded in the unconscious and in connecting a somatic response to an emotion (Ahsen, 1984; Jordan, 1984). Both of these facts lend support to the limbic system as a mediator of imagery. Imagery may be the primitive language of the body communicating to the unconscious mind through the limbic system.

The Process Model

The process model on the relationship of imagery and the brain's physiological structure rests on the observation that imagery and the limbic system are interconnected in their functioning. Imagery can effect what the limbic system does. The cognitive process of imagery and the neurological functioning of the limbic system are interconnected. There are not sufficient data to explain the exact nature of the interconnection. A speculative inference is that imagery activates limbic activity. For example, thinking imagistically may increase neurotransmitter activity in the limbic area. However, the key concept of this process model is that imagery and limbic system functioning are interconnected. Therefore, imagery practices which respond to how the limbic system works can enhance imagery's effectiveness.

Limbic system activity can explain a wide array of effects that imagery appears to have on the mind and body. For example...

Immune Activity

Neuropeptides are in high concentrations in the limbic system. These are small protein-like chemicals which include the opiate-like endorphins. Pert (cited in Wechsler, 1987) concludes that neuropeptides are the chemical units of emotion. A neuropeptide can latch on to cells in the immune system which rebuild damaged tissue and devour bacteria. Neuropeptides can change the direction and speed of movement of these immune system cells.

Imagery can evoke vivid emotional states thus triggering neuropeptide and immune activity. Achterberg (1985) reports changes in immune cell levels correlated with imagery. In addition, Rider (1985) specifically links changes in the levels of corticosteroids with stimulation of the limbic system through imagery and music.

The body's immune response is effected by emotions which originate in the limbic system. Since imagery evokes emotional response it can effect this.

Memory

Imagery has been used as a memory device from the time of Greek orators (Sommer, 1978). The fact that imagery is mediated by the limbic system may explain this phenomenon. Two structures within the limbic system, the hippocampus and amygdala (Restak, 1984) are highly involved in memory. The hippocampus appears to be the conduit by which memories are stored and retrieved. As a structure it is responsive to

repetitive stimulation and spatial motor sensations. This could explain how rhythmic stimulation can assist memory in superlearning or suggestopedia procedures (Eggers, 1984; Lozanov, 1978; Racle, 1979). The sensitivity of the hippocampus to spatial motor sensations could also explain the effectiveness of imagery in improving sports performance (Suinn, 1983). In short, imagery can be used to efficiently store or retrieve memories since it "speaks" to the hippocampus in the limbic system.

Emotional Regulation

The amygdala is involved with imagination and retrieving or storing memories tied to emotions (Restak, 1985). Jordan (1984) observes that the amygdala transfers somatic responses to the cortex, connecting affective and cognitive processing. Jordan also notes that the neural connections to the cortex from the amygdala are sparse. This may explain why it is difficult to accurately sense and integrate certain emotional experiences.

The limbic system works in concert with the hypothalamus, the master gland of the brain. The hypothalamus orchestrates emotional response to external stimulation and the "fight or flight" response. The limbic system surrounds the hypothalamus, and each structure has an effect on the other. The relationship of the hypothalamus to the limbic system may explain imagery's role in shifting fearful or phobic reactions to coping responses (Lazarus, 1977).

Motivation is tied to emotional response. According to Hart (1983), fear or anxiety inhibit motivation. Hart uses the term "downshifting" to describe the change from a logical response to an anxiety reaction. Learning

or productive activity is stopped because an emotion overrides reasoning ability. Positive emotional responses evoked through imagery can maximize motivation by overriding anxiety responses from the limbic system.

Since imagery effects the limbic system and hypothalamus it can assist in bringing emotional memories to conscious view, modulate emotional reactions and enhance motivation.

Altered States of Consciousness

An interesting paradox is that the limbic system is a primitive brain structure, but may be involved in expanded states of consciousness. Pribram (1981) makes the point that the frontal limbic system receives pain and temperature sensations, which have no time or space dimension. The lack of time and space perspective is also characteristic of altered states of consciousness. In addition, Pribram reports data that when the limbic system is stimulated, this results in an expanded field of perception. On the other hand, when the cortex is stimulated a narrowed field of perception results.

Ancient shamanic techniques (Eliade, 1967; Harner, 1982) include vivid imagery experiences fueled by drumming or rhythmic stimulation. Both of these techniques would create a limbic response since the hippocampus is responsive to repetitive stimulation and the entire system responds to imagery.

It may be that altered states result from quieting the narrowed focus of the cortex which allows the brain to work in a holistic manner to integrate limbic activity. The fact that endorphins exist in high levels in the limbic system and that these neuropeptides accompany states

of bliss and well-being suggest a reaction from the limbic system activity during such peak experiences.

Applications

The primary application of this imagery-limbic model is that practitioners (psychologists, teachers, music therapists or nurses) who use imagery can have the best results when they respond to how the limbic system works. First and foremost to accomplish this is including rhythm in imagery sessions, either in music or drumming. The limbic system regulates many of the body's autonomic activities which are rhythmic in nature, including heart rate and breathing. Rider (Rider et al., 1985) uses music in his work on reducing corticosteroids, and

Nelson-Burford (1987) uses drumming in her work to accelerate children's memory of basic skills.

Secondly, since the hippocampus stores spatial-motor memories, kinesthetic images of body movement or sensations within the body are essential to include when leading imagery. An example of this is asking individuals to move in the scene they are imaging (i.e., walking or reaching out to touch something) or to watch parts of their body performing a task in the image (i.e., seeing the hand write a skill).

Thirdly, since the limbic system regulates emotions, suggesting emotions that the person may be experiencing in the image is helpful. One example would be to suggest emotions (i.e., happy or sad) during an image. Another example is asking an individual to sense an emotion as it is occurring inside the body and then moving the image outside the body or transforming it (Masui, 1987).

In summary, the three keys in making imagery most responsive to limbic system activity are including rhythm, movement, and emotions in imagery instructions. Therapists and teachers can use these three keys to help people integrate emotions, speed memory, enhance motivation and experience altered states of well being and bliss.

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La base physiologique du développement d'images: le système limbique.

Cet article passe en revue les études conflictuelles qui situent le siège de la création d'images à l'intérieur du cerveau, et propose un modèle de processus de création d'images dans lequel la création d'images active le fonctionnement du système limbique. Les effets que le fait de penser en images ont sur le corps et l'esprit comprennent des changements dans l'activité immunitaire, la mémoire, la régulation émotionnelle, l'état de conscience. Ce modèle suggère que l'efficacité du développement d'images peut être accrue en utilisant des techniques qui correspondent à la façon dont le système limbique fonctionne.

Die physiologischen Grundlagen für Phantasiebilder. Das limbische System.

Dieser Artikel prüft die sich widersprechenden Reports, welche die Seite der Phantasiebilder im Gehirn lokalisieren und schlägt ein Verfahrenslimbischen Systems aktivieren. Die Auswirkung, die phantasievolles Denken auf Leib und Seele hat, schließt Wechsel in Widerstandskraft, Gedächtnis, emotionale Regulierung und Bewußtseinszustände ein. Dieses Modell schlägt vor daß die Wirksamkeit von Phantasiebildern gesteigert werden kann indem man Techniken benützt, die auf die Wirkungsweise des limbischen Systems reagieren.

Base psicológica de la imaginación: El Sistema Límbico.

Este artículo revisa los informes conflictivos que situaban el lugar de la imaginación por entre el cerebro y propone un modelo de proceso de la imaginación en el cual la imaginación activa el funcionamiento del sistema límbico. Los efectos que el pensamiento imaginativo tiene sobre el cuerpo y la mente incluyen, un cambio de la actividad inmunológica, memoria, regulación emocional y estados de consciencia. Este modelo propone que la eficacia de la imaginación puede ser aumentada usando técnicas que respondan a la manera en que el sistema límbico trabaja.

**Learning Research Combining Cognitive Processing
and Suggestopedic Variables:
A first study.**

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Abstract. This experimental lab study investigated the influence of key variables from cognitive processing and suggestopedia. Four types of study-learning directions to subjects were used in the cognitive processing variable in combination with the suggestopedic variables of preliminary mental relaxation and review with music to study learning vocabulary. Subjects (N=256) were volunteer university undergraduate students enrolled in lower level psychology classes. Students had not assigned themselves randomly to treatment cells, as shown by significant differences among the 4 processing direction cell means on the preliminary learning task given to all subjects under the same conditions before any manipulation. The analysis of covariance consequently used this preliminary score as covariate.

The cognitive processing directions variable significantly affected vocabulary acquisition scores and retention one week later. The instruction "make 3 different associations" to help learn the words was the best of 4 such directions. Calming before studying and music review had reversed effects on acquisition (but not retention); this was attributed to non-random self-assignment of subjects in learning ability to

treatment cells. A further opportunity to explore the reason for this reversal arose through the chance loss of part of the original data. The author re-collected the data lost and compared them with similar data collected by a graduate student to evaluate the effect of different experimenters. Acquisition and retention scores were higher ($p < 0.05$) when the experimenter was an experienced suggestopedic instructor than with a graduate student experimenter as data collector. Suggestions for future research were made.

* * * * *

Introduction

The purpose of this research was to investigate key variables from current cognitive processing research and several more from suggestopedic variables in learning vocabulary. Currently considerable progress has been made regarding how cognitive processing and suggestopedia help learn material. Typically western psychologists are not familiar with suggestopedia and the considerable improvement that it can make in helping students learn. For instance, foreign languages can be learned some three to five times faster than conventionally here in the West (Lozanov, 1978). First we review the cognitive processing variables, that is, the instructions or strategies that students are requested to perform as they learn verbal material. This breaks down into asking students to make images, or to make different types of tags, or to make sentences, or to simply use their own style, their own preferred way of learning verbal material. According to Pintrich et al. (1986), this is a very active and exciting area of research. Cognitive skills that students bring with them not only are crucial in instruction, but the cognitive abil-

ities that are developed by means of strategies are just as crucial.

There is no question but that making pictures in one's head helps learning; Pavio and Desrochers (1980) summarized research and showed that picture memory is effective due to a dual coding process, verbal and imaging.

According to Postman and Knecht (1983) and also Toppino and Gracen (1985), there is only weak evidence for providing multiple cues for the same response or target stimulus in learning. This is contradicted completely by Mantyla (1986) in his controversial research in Sweden. Mantyla researches and discusses the phenomenon of nearly perfect recall from having students make their own relevant and distinct associations to word stimuli. This present research attempted to dig out details as to how we can reconcile these conflicting viewpoints about cues in helping learning.

In addition, distinctiveness of cue or association helps (Mantyla, 1986). Jacoby et al. (1979) reported that increasing the difficulty of semantic decision making at encoding time led to improved retention. The theory is that the decision making difficulty adds to the distinctiveness of the cues or tags and thus helps memory.

Making sentences to help learn words has long been known to be helpful in learning word definitions. In particular Stevenson (1981) and Bradshaw and Anderson (1982), reported that having students make sentences using a cause and effect relationship helps learning vocabulary learning. In addition, Stein and Bransford (1979) found that having subjects focus on the significance of words in sentence making really helped. Goetz et al. (1981) reported that having the word defi-

nitions worked into sentences in an integrated way helped recall.

Thus there were four different levels or approaches compared in this research to try to tease out the relationships in the research just reviewed. Thus one group of subjects was requested to make three different relevant and distinctive tags or associations to help learn vocabulary definitions. A second group was requested to focus on different modalities, and to make one visual, one auditory, and one kinesthetic or feeling association. A third group of subjects was asked to make sentences defining the word to help them learn vocabulary definitions. The fourth group was asked to learn the vocabulary of the words their own best way as a control.

Our prediction was that the best group (and instructions) would be: Group 2. (make 3 tags in different modalities), followed by 1. (make 3 different tags), then group 3. (make 3 meaningful sentences), and finally 4. (learn own way). This also is supported by the work of Mantyla (1986).

The work of Lozanov in suggestopedia, or the systematic and comprehensive use of Rosenthal's suggestive-expectancy principle in learning, is yet not well known in the United States. However Lozanov provides convincing evidence both by himself and others, that many academic subject matters and specifically foreign languages can be taught and learned some three to four times faster than when the same subjects are taught conventionally. This surprising claim has been verified by the author (Schuster & Gritton, 1986), but suggestopedic variables need to be combined with cognitive processing variables. Specifically, Lozanov states that learning should be fun and enjoyed in a relaxing low

pressure atmosphere. Morris et al. (1981) showed that the worry aspect of anxiety results in a learning decrement. Wine (1980) showed that anxiety causes its decremental effect on learning via providing self-focusing thoughts rather than on-target thoughts that interfere with learning. Schuster and Martin (1980) showed that anxiety during learning as well as chronic anxiety on the part of the student both interfered with the effectiveness of learning word definitions.

Lozanov in his suggestopedic approach also makes the statement that a passive review of previous material can be very helpful in helping promote long term memory. Again the work of Schuster and Gritton (1986) supports this. In this study, half of the students reviewed the material in exactly the same way as originally presented. The other half a suggestopedic review with baroque music to learn word definitions.

Method

The research design used a hybrid ANOVA model to investigate cognitive processing directions and suggestopedic independent variables for their influence on learning vocabulary. See Table 1 for an overview of all variables.

The experiment conceptually was a full factorial analysis of variance design with between subjects factors of: processing directions, preliminary mental calming and review with music and sex of subject. Within subject factors were: vocabulary list easiness, and practice-fatigue. The cognitive dependent variables were vocabulary immediate learning score and one week later retention score. Affective dependent variables were ratings of calmness prior to learning, alertness and pleasantness while learning, and extent of following directions.

Table 1. List of independent and dependent variables

Independent Variables

	Levels
1. P, Processing directions:	
1 - Relevant & distinct tags,	
2 - Visual, auditory and kinesthetic images,	
3 - Sentence making, 4 - Own best way	4
2. C, Calming one's mind: 1-no, 2-yes	2
3. M, Music review: 1-like first, 2-passive music	2
4. G, Gender of subject: 1-male, 2-female	2
5. O, Order of lists: A, B, C or D.	4
6. E, Easiness of vocabulary: 1-hard, 2-easy	2W
7. P, Practice: first or second list within	
Easiness level	2W
- L, List # of vocabulary: 1-4, counter-	
balanced over Easiness & Practice	4
- Subject replication: 1-2 per cell	2

Dependent Variables

1. Vocabulary acquisition score right after learning: 0-25 range.
2. Vocabulary retention score 1 week later: 0-25 range.
3. Mental calmness rating before learning: 1-9 range.
4. Pleasantness rating while learning: 1-9 range.
5. Alertness rating while learning: 1-9 range.
6. Following directions rating after learning: 0-100% range.

*W-Within Ss factor nested within the Order factor in a counter- balanced ring fashion.

* * * * *

Here is a short description of these major independent variables. Under different processing instructions, subjects were asked to make 3 relevant and different images to learn word definitions, or to make one visual + one auditory + one kinesthetic- feeling image to learn words, or to make 3 meaningful sentences to learn words, or to learn the definitions their own best way. Under the calming prior to learning instructions, subjects were asked to quiet their mind for 3 minutes prior to studying a list, or not so asked. Two music review conditions were used: subjects reviewed a given list quietly with baroque music playing for the last 3 minutes, or actively as in their first 7 minutes studying the list without music.

Subjects (N = 256) were volunteers recruited from beginning psychology classes at ISU, and were put through a designated set of mental processing directions in groups of 32-40 people following the above design. Initially all subjects took a preliminary vocabulary list and quiz under common standard conditions for possible use as a covariate. Then following the design, subjects were asked to relax, or not, by watching their breathing for three minutes, a well-known procedure for mental relaxation. Refer to the Appendix for instructional details. Instructions for type of processing were repeated by printed instructions before studying each successive list. In learning a list, subjects studied a list on a printed page for 7 minutes, with an announcement every minute of the time left. A given list was then studied for the remaining 3 minutes with or without music following the design specified above. Quiz #1 was given. Then the instructions were repeated before list and Quiz #2. Then came a 10 minute break. Lists 3 & 4 followed similarly. The time was at about 1 1/2 hours per group.

The posttests were given 7 days later with no time limits, followed by a debriefing. Subjects were reminded the night before by telephone to appear for the posttest. The time was estimated at 45 minutes per group. Subjects received class credit for their participation in this study.

To insure having data for at least 2 subjects per cell as replications, 3 subjects initially were assigned per treatment cell. After post-testing one week later, protocols for subjects with incomplete data or those who hadn't followed directions were discarded. If there were yet 3 reps per cell, one was then discarded at random to result in 2 replications for all treatment cells. Note - in future research the possibility of discarding data to balance learning ability should be explored.

Results

First was an analysis of control variables to see if the experiment had been conducted appropriately and if the manipulations had been effective. Specifically, the scores on the preliminary quiz which all subjects took before any manipulations occurred were analyzed to see if subjects had randomly assigned themselves equitably to all of the 32 experimental cells in terms of ability to learn vocabulary. There was one effect near significance for the effect of processing directions on the preliminary acquisition scores ($F = 2.48$, $df = 3/224$, $p = .06$). Using the subsequent Student Newman-Kuels test among the four cell means, this was significant beyond the 5 percent level; the processing direction of make one visual, one auditory and one kinesthetic-feeling tag resulted in initial acquisition scores significantly higher than for the processing direction to make three sentences to help learn each word. As a result of this marginal finding, it was decided to use either an inter-

action ANOVA or an analysis of covariance with the initial acquisition scores as the covariate or the pretest.

Also to test the effect of the manipulations, the four ratings, Calmness, Pleasantness, and Alertness scored on a scale from 1 = low to 9 = very high, were analyzed along with the Following directions variable scored in percent.

The Music review manipulation had a significant effect on all three affective dependent variables. See Table 2.

These results indicated that the use of the music review had affected the subjects' emotions favorably as expected.

Table 2. Affective rating averages vs. review with music

Review with music	Calmness	Pleasantness	Alertness
1. Not used (N=128)	5.71*	4.17*	4.01*
2. Used (N=128)	6.11	4.91	4.50

* $p < .05$, ** $p < .01$

* * * * *

There was only one minor difference in the Following directions variable and that was for the interaction of Gender, Calming beforehand and Musical review. ($F = 5.11$, $df = 1/224$, $p < .03$). This was ignored as a chance finding.

Finally, the influence of the Calming beforehand independent variable was analyzed for its effects on the dependent variables of Calmness, Pleasantness, Alertness

and Following directions. All of these were nonsignificant ($p > .05$). We don't know why this independent variable manipulation did not have an effect, as this result is contrary to the previous literature. Perhaps the time (4 opportunities of 3 minutes each) was too short and the subjects had not had sufficient time to practice, which has been reported before in the literature. It is also possible that the subjects as college students did not take the calming instructions seriously (watch your breathing quietly for three minutes).

We turn now to the analysis of covariance for the effect of the four major independent variables on the dependent variables of immediate acquisition and delayed recognition scores. The effect of processing direction significantly affected immediate acquisition ($F = 10.09$, $df = 3/223$, $p < .001$). The results are graphed in Figure 1. With the Student Newman-Keuls procedure, treatments 1, 2 and 4 were significantly better than treatment 3. All three treatments (make 3 associations, make three different modal ones or do it your best way) were significantly better than "make three sentences". The Gain scores are depicted by the length of the vertical lines from pretreatment to treatment average in Figure 1. The Processing direction "make three associations" resulted in a gain of over twice as much as in the group that got the directions "make three sentences". Even the people in the supposed control group ("learn the best way") learned twice as much as the people with the directions to "make three sentences".

The effect of processing directions was significant also upon the delayed retention score. ($F = 4.91$, $df = 3/223$, $p < .005$.) Using the Student Newman-Keuls test, the mean (6.2) of processing direction 1 ("make three associations") was significantly better than the

group average (4.0) for the third group ("make three sentences"). These results are presented in Figure 2.

The effect of the Calming beforehand independent variable significantly affected immediate acquisition scores ($F = 6.53$, $df = 1/223$, $p < .02$). However the effect was reversed: no calming average = 16.7 vs. calming beforehand average = 15.5. This was due to initial random differences in the self-assignment of subjects to the different groups. The preliminary acquisition scores used as a control variable were significantly different ($p < .05$) by random selection before any treatment: no preliminary calming average = 15.46 vs. preliminary calming average = 14.0. The effect of calming beforehand on delayed retention scores a week later was not significant ($p = .86$) and the means were only slightly and trivially different.

The manipulated independent variables of Calming beforehand and Musical review in studying the word list did not have their intended effects. The Calming beforehand manipulation had a reverse effect which could probably be attributed to random sampling differences in the way that students had self-assigned themselves to treatment cells. In an effort to determine why the independent variables of Calming beforehand and Music review had not had their intended effect, a subsidiary analysis was done using a chance event. Originally all the data for the 32 treatment cells had been collected by one person, a female university graduate student from China. Having one person collect all the data was done in an attempt to control extraneous variables such as the instructor or the Rosenthal effect. The chance event was that between data collection and the data analysis, that data for four of the 32 treatment cells had been partially lost. We had all delayed retention data but some initial acquisition data were lost.

Therefore, the author collected all data a second time for these four of the 32 treatment cells.

In the experimental design, there were four replications of treatments which differed only in the order or sequence in which the tests were taken by subjects. To be specific, the author recollected data for four of the 32 cells as follows: Order A (lists 18 - 37 - 27 - 28 - 38) and Order B (lists 18 - 27 - 28 - 38 - 37). These were collected for the same exact set of independent variables with data collected by the Chinese graduate student as follows: Order C (lists 18 - 28 - 38 - 37 - 27) and Order D (lists 18 - 38 - 37 - 27 - 28). Thus the only thing different here was the sequence in which the tests were taken.

Originally it had been intended to analyze the Practice and the Difficulty of the list effects, but that proved impossible due to chance confounding. Thus the data for exactly the same test, although in slightly different order, were compared for data collected by the author vs. data collected by the graduate student.

The instructor variable significantly affected three dependent variables as shown in Table 3. Pleasantness was significantly affected ($F = 7.79$, $df = 1/48$, $p < .01$) with the Pleasantness scores for students instructed by the SALT trained experimenter being significantly higher than for the non-SALT trained graduate student instructor-experimenter. Similarly, the immediate Acquisition scores were 33% significantly higher ($F = 11.91$, $df = 1/48$, $p < .001$) for students taught by the SALT trained instructor vs. the non-SALT trained instructor-experimenter. Similarly, the Retention scores were 56% higher for the student subjects taught by the SALT-trained experimenter vs. the student subjects trained by the non-SALT trained instructor ($F = 5.80$, $df = 1/48$, $p < .02$).

Table 3. Pleasantness, acquisition and retention averages vs. instructor

<i>Instructor-Experimenter</i>	<i>Ple.</i>	<i>Acq.</i>	<i>Ret.</i>
1. SALT-trained (N=32)	5.49**	18.32**	5.87*
2. Not trained (N=32)	4.45	13.79	3.77
SALT improved	-	33%	56%

* $p < .02$, ** $p < .01$

* * * * *

The interpretation is that this was an unexpected but controlled Rosenthal effect. Probably it was due to the teaching style of the SALT trained experimenter with his cheerful, supporting, challenging approach in the classroom used to collect experimental data. However, the effect also could have been due to the fact that the instructor who collected most of the data was a female and had minor problems speaking the English language as her native language was Chinese. Nevertheless, the personality of this graduate assistant experimenter-instructor was not warm and supporting as was the author's. Thus it is felt the instructor effect primarily was due to SALT training rather than sex of the experimenter or language of experimenter.

The final analysis in this study was in analyzing the methods used by the control group "learn these word definitions your own best way". The stated methods used by the subjects in this group (N = 64) were tallied and analyzed later to determine the methods used. The best way group was split into fifteen people with the highest scores on Acquisition and into 17 people with the lowest scores, and the data for the remaining 32 subjects ignored.

The major differences in this after-the-fact analysis were as follows. Seven high scorers vs. three low scorers reported that they made an association with a common word that had a similar sound. Also, six high scorers vs. one low scorer reported that they used the auditory sense to help learn the definition of the word. Lastly, in a reverse twist, six low scoring subjects vs. three high scoring subjects reported that they simply made "word associations".

In looking at these three differences in methods that high scorers vs. low scoring subjects in the control group (best way) used, it appears that the high scorers had done some additional work, that is they picked a common word with a similar sound or they used the auditory sense in contrast with the low scorers who may simply have made word associations. Thus this additional information appears to supplement the processing direction analysis discussed earlier. If subjects had been told to make three associations including an auditory one, this typically helped, compared to the gains made by people in the control group or who were told to make three sentences to help them learn the words.

Summary

The aim of this research was to investigate the influence of cognitive processing directions and the suggestopedic variables of calming one's mind before studying and musical review of material on learning words. The study utilized an analysis of variance design. A major problem was discovered after the data were collected with the the calming beforehand and music review manipulation as independent variables. Therefore, the cognitive and negative results from manipulating these variables here should be ignored as not being well controlled.

The Calming beforehand variable had an effect opposite to that intended on the immediate Acquisition criterion which was probably due to initial differences due to random sampling in self-assignment to treatment cells. This was reflected by the control variable scores on the first list given to all subjects under standard conditions.

The Music review independent variable had positive effects as intended on the affective criteria of calmness, pleasantness, and Alertness. This factor also affected acquisition negatively.

The effect of the Calming independent variable was not significant, probably due to too short a time taken in training the subjects, which has been reported to be important in previous studies or the subjects did not take a strange procedure as this seriously.

An analysis of covariance was used to control for the known differences in initial ability of the subjects to learn vocabulary words. The effect of Processing directions was significant on acquisition and delayed retention. The directions to "make three different associations" and "make one visual, one auditory, and one feeling association" were better than directions to "make three sentences". The intended control group ("learn your own best way") was not a good control group for comparison. The best student subjects in this group used a strategy comparable to the strategy to "make three associations" or "make three different modal associations".

Finally, there was a significant instructor effect which was uncovered after the author had to recollect data for four out of the 32 treatment cells after part of these data originally collected had been lost. It

appears that a SALT trained instructor is going to a necessity in studies investigating suggestopedic variables.

Suggestions for future research are: Explore the possibility of balancing initial learning ability across treatment cells by stratified random discarding of data appropriately for orthogonal designs. Train the experimenter(s) in suggestopedic/SALT philosophy. Run short, pilot studies to verify that experimental manipulations are effective as intended. Use a control treatment where subjects are just told to learn the word definitions (not their "best way").

* * * * *

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Appendix. Directions to Subjects

Preliminary Calming

1. None. (No special preparatory activity.)
2. Yes. (Before studying each of the four lists, subjects were told:)

Watch your breathing for three minutes before turning the page and learning the list. This "clears" your mind like the "clear" button on a calculator.

- a. Close your eyes, or stare at a point on the wall.
- b. Tell yourself "in" silently as you inhale, and "out" as you exhale.
- c. Just watch your breathing, whether fast, slow or normal.
- d. When your mind wanders, gently start watching your breathing again.

Start now. (3 minutes)

Ok, that was 3 minutes. Review mentally the directions given you to help you learn the list of words. In your mind see yourself applying these directions easily and efficiently in studying the words. Imagine yourself being pleasantly surprised at how well you have done in learning the words on the quiz given later.

Processing directions #1: Relevant & different.

Make quickly 3 different associations, images, phrases or "tags" that rather clearly in your mind link the stimulus word with its definition. Each association must,

- a. be related in some way to the stimulus word and its definition,
- b. make a definite, distinct link, and,

- d. be different in some way or fashion from your other associations. You can make weird, odd, sexy and unusual "tags"; anything goes if it is relevant, distinctive, and occurs to you easily upon seeing the stimulus word. Be creative; have fun!

Here are possible questions to ask yourself for each word:

- Does the root of the word look like a word I know?
- What do I think of when I look at the word?
- What images spontaneously come to mind?
- When I say the word, what does the sound or pattern remind me of?
- Does the root or accented syllable look like another word that I can link to the definition?
- Does the word remind me of some feeling, or doing something?
- Can I take one association or tag, and do something to it in my mind, such as, make it bigger?
- Or smaller, distorted, more detailed, colored, upside down, beautiful, pleasant, musical?

Try to "define" the stimulus word in precise detail with distinct, relevant tags that occur readily to you. Ask yourself, "Will I think of the same association or tag the next time I see the word?"

See and feel yourself making lots of spontaneous images to the words. Do so right now! As you work along, you will quickly get better at this.

Processing directions #2: Visual, auditory & kinesthetic.

Make quickly 3 different associations, images, phrases or "tags" that rather clearly in your mind link the stimulus word with its definition. One such association should be a visual image, another audi-

tory, and a third kinesthetic or feeling. The sequence or order in which you do these is not important; just be sure to do all 3. Be creative; have fun!

To help in visual associations, ask yourself, "What do I think of when I look at the word? Can I make a picture to help me learn its meaning? What images spontaneously come to mind?"

To help in auditory associations, ask yourself, "When I pronounce the word, what does it sound like, or similar to?"

Can I make a pattern or rhythm when I say the word? Can I make a rhyme with another word ending the same way?

To help in kinesthetic or feeling, ask yourself, "How do I feel when I repeat the word? Does the word remind me of doing something? If so, how can I link this feeling or action to the definition?" Can you imagine yourself acting or doing the definition?

Try to "define" the stimulus word with a sensory tag of each major type, auditory, kinesthetic and visual. You may also use smell or taste associations if you wish.

See and feel yourself making lots of spontaneous images to the words. Do so right now! As you work along, you will quickly get better at this.

Processing directions #3: Sentences.

Make quickly 3 different sentences that use the word meaningfully according to its given definition.

Each sentence should make sense to you, and should be at least somewhat different than the others in the way you use the word.

Try to "define" the stimulus word by using it in different ways in 3 sentences. You may make questions if you wish with the word. Be creative; have fun!

See and feel yourself making lots of spontaneous sentences to the words. Do so right now! As you work along, you will quickly get better at this.

Processing directions #4: Best way.

Quickly learn the definition for each stimulus word the best way you know how. There are many possible ways you might do this, but you should use the method that you know has worked for you in the past. Use this best method to learn the definitions of all the words. Be creative; have fun!

We want to find out how people who are good at this, do it. So please describe briefly your method here:

See and feel yourself learning the words easily this way. Do so right now! As you work along, you will quickly get better at this.

Manipulation of Review with Music:

1. *Repeat first 7 minutes.* (The last 3 minutes are exactly like the first 7 minutes; Ss study the same list for another 3 minutes.)
2. *Review with music.* (Directions to subjects:) "Listen to the music for a minute. Relax and let yourself flow along with the music."
(One-half minute.)

"Now I'm going to read the words slowly from your list. Pay attention to how my voice sounds. You may follow along on the page, or close your eyes if you wish. You may review your mental activities from the first few minutes if you wish, but pay attention to how each word sounds and its definition."

* * * * *

Recherche sur l'apprentissage lié au traitement du développement cognitif et aux variables suggestopédiques, une première étude.

Cette étude expérimentale de laboratoire a recherché l'influence des variantes clés issues du développement cognitif et de la suggestopédie. Quatre types de direction d'étude/apprentissage vers des sujets avaient été utilisés selon la variable du développement cognitif, en association avec les variables suggestopédiques de relaxation mentale préliminaire et de révision avec la musique pour étudier le vocabulaire d'apprentissage.

Les sujets étaient des étudiants universitaires de licence choisis dans les classes de premières années de psychologie. Ils ne s'étaient pas affectés par hasard à telle ou telle cellule de traitement, comme l'ont montré les différences significantes entre les moyens des quatre cellules de direction de traitement d'après la tâche préliminaire d'apprentissage donnée à tous les sujets

dans les mêmes conditions avant toute manipulation. L'analyse de covariance a utilisé par la suite ce résultat préliminaire comme covariable. Une semaine plus tard, la variable des directions de traitement du développement cognitif a affecté de façon significatrice les scores d'acquisition et de rétention du vocabulaire. L'instruction "faire trois associations différentes", pour aider à apprendre les mots a été la meilleur des quatre directions. La période de calme avant d'étudier et la révision avec la musique ont inversé les effets de l'acquisition (mais pas de la rétention); ceci a été attribué au fait que les sujets n'avaient pas choisi par hasard leur cellule de traitement. Une occasion supplémentaire de découvrir la raison de cette inversion apparut lorsque par hasard une partie des données originales fut perdue. L'auteur s'est souvenu des données perdues et les a comparées avec des données similaires réunies par un étudiant gradué pour évaluer l'effet de différents expérimentateurs. Les scores d'acquisition et de rétention étaient plus élevés ($p < .05$) quand l'expérimentateur était un instructeur suggestopédique expérimenté que lorsqu'il s'agissait d'un étudiant gradué collecteur de données. On a fait des suggestions pour futures recherches.

Lernforschung, die cognitive Verfahrensweisen und suggestopädische Grossen kombiniert: eine erste Studie.

Diese experimentelle Laborstudie untersuchte den Einfluss von Schlüsselvariablen auf cognitive Verfahrenswesen und Suggestopädie. Vier Typen von Studier/Lernrichtungen auf Personen wurden in den cognitiven Verfahrensvariablen in Verbindung mit suggestopädischen Variablen von einleitender geistiger Entspannung und Wiederholung mit Musik zur Untersuchung von Vokabeln benutzt. Die Personen ($N=256$) waren freiwillige Universitätsstudenten, die in Eingangsklassen in Psychologie eingeschrieben waren. Die Studenten hatten sich

nicht selbst willkürlich zu Behandlungsgruppen zusammengeschlossen, wie sich durch signifikante Unterschiede unter den vier Verfahrensrichtungsgruppen in der einleitenden Lernaufgabe, die allen Personen unter den gleichen Bedingungen vor jeglicher Manipulation gegeben wurde, herausstellte. Die Analyse der Kovarianz benützte diese einleitenden Ergebnisse folglich als Kovariate. Die cognitive Verfahrensrichtungsvariable beeinflusste die Ergebnisse von Vokabelerwerbung wie auch das Erinnerungsvermögen nach einer Woche signifikant.

Die Anweisung "machen Sie drei verschiedene Assoziationen" zur Hilfe des Wörtererlernens war die beste von vier solcher Anweisungen. Beruhigung vor dem Lernen und Wiederholung mit Musik hatten gegenteilige Auswirkungen auf den Erwerb (nicht aber auf das Behalten); dies würde der nicht zufälligen Selbstzuordnung der Personen in Behandlungsgruppen nach Lernvermögen zugeschoben. Eine weitere Möglichkeit, die Ursache für diese Umkehrung zu untersuchen, ergab sich durch den zufälligen Verlust von Teilen der ursprünglichen Daten. Der Verfasser erinnerte sich an die verlorengegangenen Daten und verglich sie mit ähnlichen Daten, die von einem Diplomanden zur Auswirkung der Wirkung verschiedener Experimentatoren gesammelt würden. Die Ergebnisse für Erwerb und Behalten waren grosser ($p < .05$) wenn der Experimentator ein erfahrener suggestopädischer Unterweiser war, als mit Diplomanden als Datensammler. Vorschläge für zukünftige Untersuchungen würden gemacht.

Investigación del aprendizaje, combinando el proceso cognitivo y variables sugestiopédicas, un primer estudio.

Este estudio experimental de laboratorio investigó la influencia de variables clave del proceso cognitivo y de la sugestiopedia. Cuatro tipos de directrices y de aprendizaje fueron utilizados para los individuos en la

variable del proceso cognitivo en combinación con las variables sugestiopédicas, las cuales fueron preliminares a una relajación mental y a una revisión con música para el aprendizaje de vocabulario. Los sujetos (N=256) fueron estudiantes universitarios voluntarios matriculados en las clases iniciales de psicología. Los estudiantes no se asignaron ellos mismos al azar a las celdas de tratamiento, tal y como muestran las diferencias significativas del proceso directriz de la celda sobre la tarea de aprendizaje preliminar, que se dió a todos los individuos bajo las mismas condiciones, antes de cualquier manipulación. Consequentemente el análisis de covarianza usó esta puntuación preliminar como covariativa.

Las directrices del proceso cognitivo variaron significativamente afectando a las puntuaciones en la adquisición de vocabulario y de retención una semana mas tarde.

La instrucción "realiza tres asociaciones distintas" para ayudar a aprender las palabras fue la mejor de las cuatro directrices. Tener relajación antes del estudio y hacer una revisión musical repercutió en la adquisición (pero no en la retención), esto fue atribuido a la no utilización del azar y a la propia asignación de los sujetos en habilidad de aprendizaje a las celdas de tratamiento. Una oportunidad posterior para explorar la razón de esta repercusión surgió a través de la pérdida fortuita de parte de los datos originales. El autor recopiló los datos perdidos y los comparó con datos similares coleccionados por un estudiante graduado para evaluar el efecto de los distintos experimentadores. Las puntuaciones de adquisición y retención fueron mayores cuando el experimentador era un instructor sugestiopédico experimentado que cuando este era un estudiante graduado. Se realizaron sugerencias para una investigación futura.

BOOK REVIEW

In Their Own Way: Discovering and Encouraging Your Child's Personal Learning Style

by Thomas Armstrong, Ph.D.
Jeremy P. Tarcher, Inc., 9930 Sunset Blvd.
Los Angeles, CA 90069

Reviewed by John Senatore

"Six years ago I quit my job as a learning disabilities specialist. I had to. I no longer believed in learning disabilities," the author wrote in the Preface.

If you're a parent of a child in special education, or a parent of an overachiever, normal achiever, underachiever who simply isn't getting much out of schools, or if you're an adult who had a hard time in school, or if you're a teacher, a counselor, mental health professional or someone who wants to move away from "deficiency consciousness so prevalent in modern day education and towards an appreciation of the giftedness in *all* learners," this book is definitely useful for you.

"I decided to write a book about the dangers of labeling children as disabled learners," Armstrong wrote. "I had a long angry manuscript entitled *The Learning Disability Lie ...* something didn't feel quite right to me ... It was well and good to condemn something but what did I have to offer instead." This book on learning styles is his easy-to-read, practical--and radical--alternative.

I am overjoyed that Armstrong has taken Howard Gardner's 1983 model *Frames of Mind: The Theory of Multiple Intelligences* to center the revolution in education that must occur. For me, Armstrong came to realize: The limitations are not in the real world but in our models of the world.

Reading this book, you may awaken to remember that "intelligence" is a nominalization.

Using Gardner's multi-cultural model of seven intelligences (linguistic, spatial, kinesthetic, logical-mathematical, musical, interpersonal and intrapersonal), Armstrong shows that when we fail to recognize multiple intelligences in ourselves and others, we label, exclude, dishonor, damage and deprive all of us. This book shows how to teach--and learn--in seven different ways so all persons may be reached in math, reading, spelling, writing, wherever.

No, this is not a blaming-ain't-it-awful book. This book shows anyone how to discover what the present state is, how to access the person's resources (learning styles), what actions to take to develop unique learning style--even with the present state of education unchanged. How elegantly simple it seems: Replace what doesn't work with something that does work.

Chapter titles promote my preferences: for example, "Testing for Failure," "Dysteachia: The Real Reason Your Child Isn't Learning in School," "Bodywise" (put the body and movement back into every classroom, not just PE), "The Doors of Perception: Helping Children Come Back to Their Senses."

The Afterword explores the learner of the future with messages I hear elsewhere: Our children are dif-

ferent. So-called unmotivated and "learning handicapped" children may instead be the vanguard of a whole new way of processing information, so we must pay attention for we humans: are information-processing systems.

Concluding the book is a comprehensive collection of resources: best books, cassettes, periodicals, organizations, and SALT is there under "Superlearning Approaches."

Spread the word. As we remember that our models determine our behavior but we determine our models, we can change our maps of reality. Specifically in this case, we can change our model of "intelligence." And that is a difference that makes a difference.

BOOK REVIEW

Effective Secondary Teaching: Going Beyond the Bell Curve

by James Quina
New York: Harper & Row, 1989

Reviewed by
Donald H. Schuster

This book is the culmination of 10+ years of field testing and synthesis of concepts from brain research, accelerative learning data, the world hypotheses of Stephen Pepper, and the philosophical ideas of Aldous Huxley. The methods were developed jointly in a graduate course for teachers at Wayne State University and in teaching at Murray-Wright High School in Detroit. Students thus trained have used these methods in their own classes, and then returned to teach new students these effective methods. This is historical validity at its best: the dissemination of teaching methods to a new wave to teachers. Why pass on these techniques? Because they work.

Effective Secondary Teaching (EST) is a stimulating synthesis of traditional and recent approaches to teaching. These approaches appeal both to the intellect and imagination. Behavioral psychology is there with writing lesson plans, learning objectives and keeping class control. But beyond behaviorism are techniques from whole brain research. The book's 22 chapters and 4 appendices provide comprehensive details.

Quina starts off by examining the question, "What is effective teaching?" Many current possibilities and philosophies are examined, but Quina concludes that no formula for action can produce effective teaching. Nevertheless, he sows the seeds of effective teaching in the next 21 chapters.

In order to improve any situation, one should examine and evaluate the present situation. Thus Quina looks at high school teachers today: misconceptions, reality and potential improvement. To promote excellence in schools, we must address the hidden curriculum: desire for learning, improved self-concept, and respect for others, in addition to the 3 R's. The behavioral approach is a big step in the right direction.

Next Quina tackles making effective instructional objectives in the cognitive domain. This is decision making, what to teach, how to test for learning, and how to facilitate learning. The danger of exclusive reliance upon behavioral objectives is that they promote a narrow range of performance. Quina uses the work of Hunter, Mager and Bloom to enlighten the teacher on behavioral objectives.

Of considerable interest to SALT teachers is the next material on creating effective instructional objectives, particularly in the affective and psychomotor domains. (Remember, "How will I create joy today for my students?") Students may approach or avoid a given subject, depending on their feelings, values and attitudes. Building positive attitudes through affective teaching increases cognitive learning as SALT teachers know. Quina offers help on the how-to, by examining Krathwohl's taxonomy as well as discussing typical reasons for not setting objectives for affective teaching. A minor criticism by this reviewer is that Quina has

slighted the psychomotor domain in view of the time allotted, about 50% typically, to the SALT practice phase.

In the chapter on designing effective lesson plans, Quina examines and compares the behavioral model, Hunter's model and a SALT model. The teacher must decide the plan and format for lessons before class; this includes making decisions about the cognitive and affective levels as well as the degree of interaction with students. Effective teachers will experiment with their own formats depending on the purpose.

The chapter on Creating Units and Courses will help the teacher with globalization, relating today's lesson unit to the overall course. (How does today's lesson fit into the big picture in this class?) This chapter provides a model and examples of instructional design. A standard format was outlined: purposes, rationale, content, procedures, materials, activity, and evaluation.

After planning lessons, Quina tackles instruction and evaluation. First is an examination of teaching styles and strategies, which in turn starts with the traditional lecture and how to improve it, SALT for example. Techniques discussed ranged from recitation to group work to questioning and finish with integrative techniques between verbal / nonverbal, between disciplines, and between knowledge and reality.

Working effectively with handicapped students is challenging and important...and Quina clarifies how.

SALT teachers will want to study the chapter on Metaphor as Method for its use in enlivening their own classes. Quina uses Pepper's classification of 4 root (or basic) metaphors as a way of appealing to students' reality in teaching. The root metaphor of formism is

similarity, that of mechanism is the machine, that of contextualism is the changing historical event, and that of organicism is harmonious unity. By varying the type of metaphor used, a teacher can appeal to differing preferences in metaphoric style to help make the strange familiar for learning, and the familiar strange for motivation.

The chapter on homework explores how to make homework purposeful and effective. Organized approaches to studying, idiosyncratic note-taking symbols, preparing for exams, parent support, memory techniques and creativity strategy all are discussed and illustrated.

Quina includes a chapter on test development to introduce and summarize the principles of good test development - to help in good teaching of course. (How is "good" teaching determined?)

The chapter on motivation is an interesting synthesis of techniques for overcoming student resistance to learning; it's worthwhile to buy the book just for this. Quina reviews the behavioral, cognitive and growth approaches, modelling, neurolinguistic programming, and Suggestopedia. Then he gives examples of how to apply them.

The organized teacher is more than having organized grade books and lesson plans; it is being responsible for using time productively and satisfyingly in teaching and life, without being Type A hyper in the process. This chapter has good tips for evaluating and improving the use of time, to manage it in teaching.

Effective teaching is effective communication.
(Shades of Suggestopedia!) Communication leads to

agreement, which leads to empathy and understanding. Communication balances the experiences of the teacher with those of the students. Through communicating these experiences education is created.

Quina recommends that the teacher develop his/her own philosophy of classroom management, following looks at assertive discipline, operant conditioning, suggestopedia and optimal learning. This synthesized personal approach should be aligned with school administrative policy.

Teaching is stressful at times, sometimes frequently. Stress needs to be recognized so that it can be converted into a positive force. Many ways exist; the problem is using one or more of them: music, humor, contextual shifts, diet, rest, deep breathing, yoga, visualization, exercise, to name a few.

Quina has an interesting, useful chapter for the beginning teacher: Getting hired. How to generate job interviews, prepare a resume, and appearance-behavior in an interview, are all critical and well covered.

The education profession and educational institutions are in the midst of rapid change. Schools can expect challenges increasingly for accountability, educational quality, teacher competence, legal rights, and alternative education for the unruly. Teachers must keep abreast of legal developments.

Professional development as a teacher is Quina's last chapter. This starts by taking self-inventory: Am I satisfied with what I'm doing? What do I want to be doing next year, 10 years from now? Assuming I celebrate my 100th birthday, what do I want to be remembered for? Then Quina explores the many ways of personal

and professional growth: reading, workshops, conferences, travel, research, to mention just a few.

There's more! The appendix covers teaching to the whole brain, music lists for teaching and learning, instrumentation of Bloom's Taxonomy, self-management charts, a glossary and bibliography.

All in all, Quina's book is inspiring, comprehensive and worth many hours of study. Personally, I would like to see the book required reading for our college courses in teacher education all across the country.

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